

# AUTOMOTIVE INDUSTRIES

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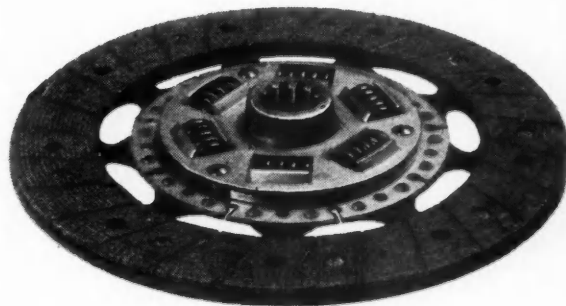
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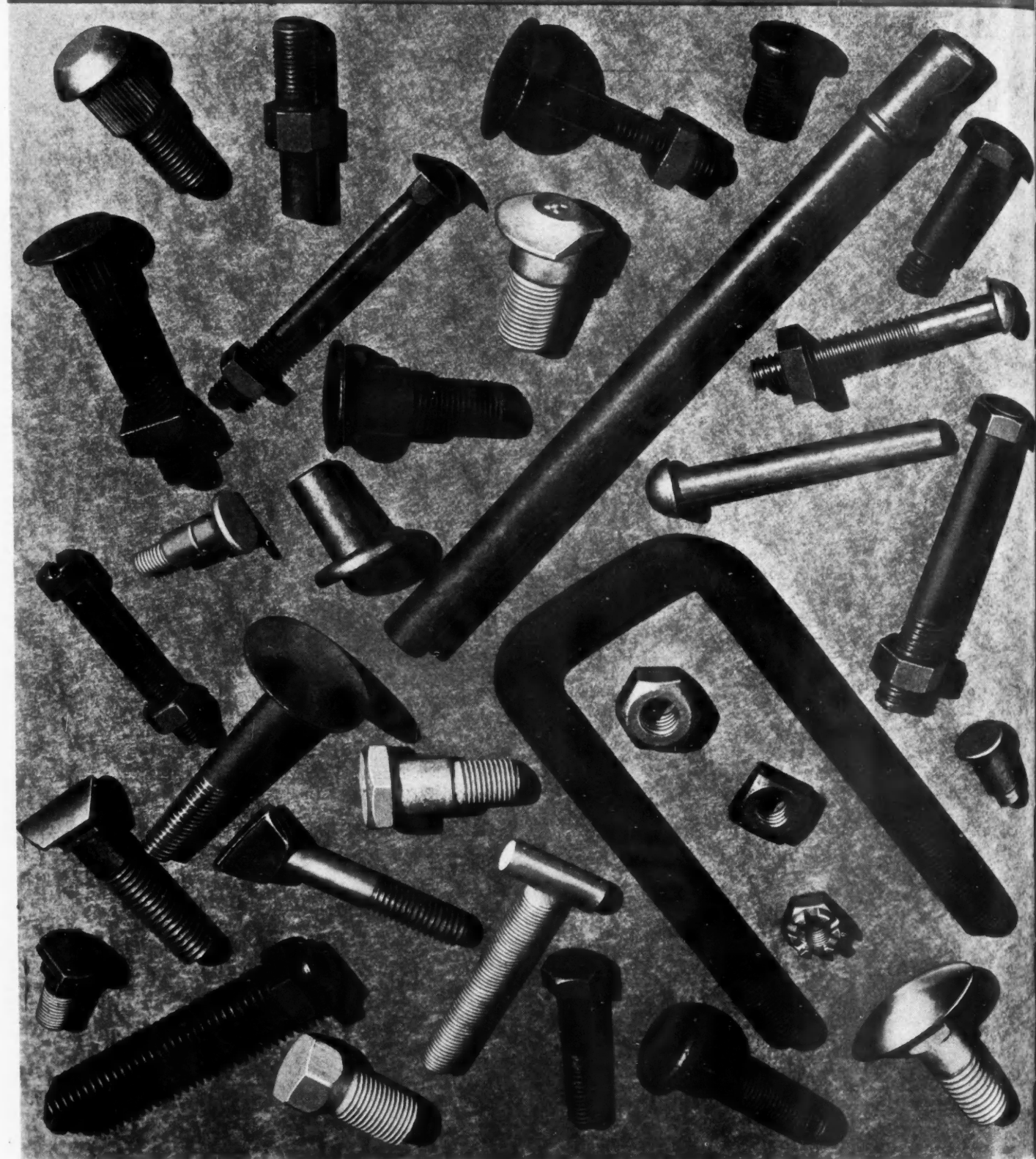
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# ***BOLTS*** may seem



September 15, 1939

When writing to advertisers please mention *Automotive Industries*

*Automotive Industries*

## Automobile Progress Epitomized In Mount Washington Ascent

***Just 40 Years Ago it Took Freeland O. Stanley of Steamer Fame 2 hr. 10 min. to Make the Climb. Today's Record Stands at Little More than 12 min.***

**J**UST 40 years ago a landmark in automobile history was set when Freeland O. Stanley of Newton, Mass., with his wife, drove to the top of Mount Washington, a climb of about 4600 feet over an eight-mile dirt road, in the first motor vehicle ever to make the ascent. The car, known as the "Locomobile," was the invention of Mr. Stanley and his twin brother, Francis E. Stanley, and manufactured by them at Newton, and was the fore-runner of their more widely known machine, the Stanley Steamer, which became famous for spectacular records at Ormond Beach, Fla.

The road, which had been used by horses for about 40 years, was in no condition for a speedway. Every few rods it was crossed on a slant by a little ridge or water-bar to turn off the rainwater. These little obstacles, popularly called "thank-you-ma'ams," were traditionally supposed to number as many as there are days in a year, so a motorist could count on plenty of bouncing. So Mr. Stanley felt that he had done pretty well in reaching the top in 2 hours and 10 minutes of actual driving time, or about half the usual horse time. Of his 3-gallon stock of fuel he had used less than two gallons, but the water tank required one complete refilling.

In an interview with the present writer, then editor of *Among the Clouds*, a daily paper printed on the mountain, Mr. Stanley said:

"We found the ascent up the mountain more difficult than we anticipated, although we had no trouble in climbing the steepest grades. The day was perfect, being practically cloudless, with no wind. . . .

"As the carriage is constructed for road use we found it necessary in climbing the mountain, where the average grade for eight miles is approximately 12 per cent, to jack up the rear wheels and run the engine for a few minutes in order to supply sufficient water to the boiler. In other respects the journey up the mountain was as free from any interesting incident as the same distance traveled on level."

Not only in climbing but in long distance touring

Mr. and Mrs. Stanley were pioneers and in their 197-mile journey from home had made the unusual average of 14.1 miles per hour over the primitive country roads of the period. "This we regarded," he said, "considering the condition of the road, quite remarkable. . . .

"The fact that during the entire trip from Newton to the summit, a distance of 205 miles, not the slightest difficulty in the way of breakage or loose nuts or anything to mar the pleasure of the journey happened is quite remarkable."

"The Stanleys had made their journey on a sort of horse-and-buggy schedule, spending nearly a week on



**The October 1 issue of *Automotive Industries* will be devoted to Forty Years of Progress in the Automotive and Machine Tool Industries. In this article is examined one of the early milestones from which progress is measured.**



the way and stopping often for rest and sight-seeing, their longest day's run being 54 miles. One stretch of about 60 miles, Mr. Stanley said, "was about as difficult for a motor vehicle as could be imagined. So deep was the sand in places that it took the full power of the machine to drive it on a level. The grades, fortunately, were a little gravelly, having a better road surface."

Mrs. Stanley, who died on July 24 of this year at an advanced age at Estes Park, Colo., where for many years the Stanleys have had their summer home, spoke warmly of the fitness of such cars for the use of women.

"A lady can very easily learn to steer it," said Mrs. Stanley, "it is steered by a handle very much as you steer a bicycle. She needs to become somewhat familiar with the mechanism, but it is not at all complicated, and she can readily acquire the necessary skill to manage the machine. She must know enough about its workings to instruct the stable boys whom she would have to hire to take care of it and clean it at the stopping places on the journey. Even without this knowledge she could, if the machine were in perfect order, take a ride of 15 or 20 miles just as well as a man.

"The motion of the machine is fascinating. It seems more like flying than anything else. In a carriage the horse raises a great deal of dust, and especially in a dry time it is very disagreeable driving through a sandy country. But with our vehicle we have generally gone at such a rate of speed that we have created sufficient breeze to take away the dust that our wheels made, so that when we reached our destination we have found ourselves practically dustless. Even our linen did not bear the marks of travel. So I think its cleanliness would commend the Locomobile, especially to women. You do not get soiled as you do in traveling by rail or by carriage. Then we have another advantage—we can choose our path much better than when driving. If we find the road too difficult, we sometimes go out on the greensward, and in that way we have escaped some of the inconveniences of the sandy roads. You cannot choose your way with a horse. A horse

will not turn the instant you draw your rein, but the Locomobile will change its course the moment you turn the handle-bar.

"I should advise a wheeling costume for any lady who is going on a long journey like this. If you are taking a short pleasure ride, an ordinary carriage costume is the correct thing. But for a journey an outing costume with short dress and shirt waist is the best. You have to be careful about your headgear and have something that will not blow off. Sometimes when you go rapidly in a high wind, it will take off any sort of hat that is not fitted close to the head. I wore a wheeling cap up the mountain, and for ordinary wear I have a white linen hat, which keeps the head cool, the flexible brim of which can be arranged to keep off the sun on either side. I do not take a parasol or umbrella; we have to guard against the resistance to the wind as much as possible.

"We only carry small handbags with a change of linen and a few small articles, and have our trunks sent on to points where we are to make stops of several days. We can get along very comfortably if we do not feel particular about appearing in the evening in evening costume. We make no attempt to be fashionable, and people don't expect it.

"A pleasant feature of our journey has been the great pleasure that our appearance seemed to give everybody, for the people in the towns and on the farms that we have passed have run out to the roadside and greeted us with smiles and in some cases with uproarious laughter.

"We shall go to North Conway from here, and after visiting various parts of the mountains expect to go to Poland Springs and elsewhere in Maine. I do not feel the least uneasy about riding down the mountain, for the machine has a powerful brake and the power can be instantly reversed."

It may have been just a coincidence, but from the date of Stanley's conquest of Mount Washington the makers of autos strove as never before for hill-climbing power. Noteworthy were the contests on Corey Hill in Brookline, Mass., where gains were registered which then seemed large but would now be trifling.

(Turn to page 292)

### The Brass-Hat Rack



—and he says forget about those plans for a new car in the next price-class. One preview a year is enough!



# BUSINESS IN BRIEF

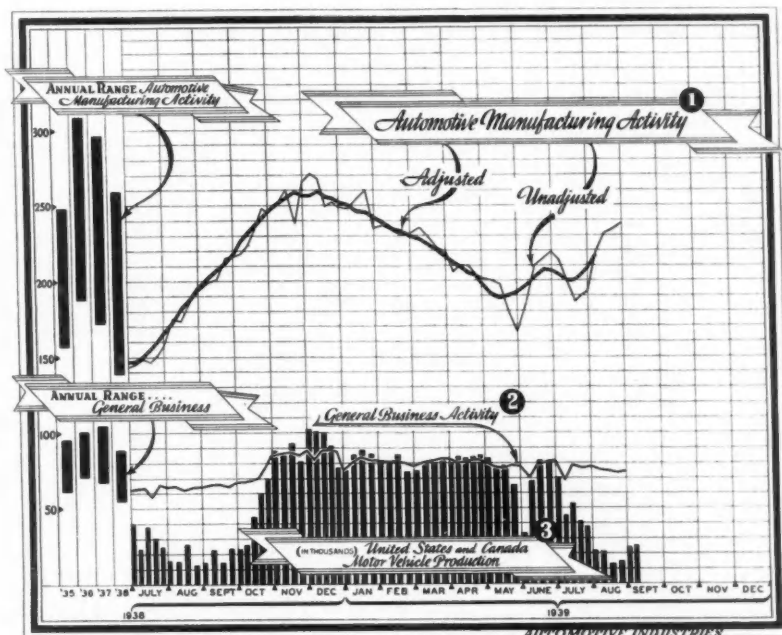
*Our own view of automotive production and sales;  
authoritative interpretation of general conditions*

**P**RODUCTION of cars and trucks in the first two weeks of September increased steadily over the rates in effect during the preceding period. Output for the week ending Sept. 9 was affected to some extent by the Labor Day holiday in the case of plants on a five-day week and it is estimated<sup>2</sup> that output for that week was slightly over 25,000 cars and trucks. An increase of at least 6000 units was anticipated for the week ending Sept. 16 to bring September production to that date to approximately 63,000 cars and trucks.

Substantial gains in production were expected for the last half of September, although the industry is not expected to reach top figures until some time in October after the volume producers get going. To date Plymouth has been the only contributor among the big three of the lower-priced cars to weekly totals and the big upswing will not be noted until Ford and Chevrolet get underway. As this was written the independents, notably Packard, Hudson, Nash, and Studebaker, were closer to their top productive capacity than any of the major producers.

AUTOMOTIVE MANUFACTURING ACTIVITY is increasing steadily as indicated by the unadjusted index<sup>1</sup> which advanced 14 points to 231 for the week ended Aug. 19, another three points to 234 for the week ended Aug. 26, and four more points to 238 for the week ended Sept. 2. The adjusted index<sup>1</sup> stood at 203 for the week ended July 29 and it has advanced to 208 for the week ended Aug. 5 and to 217 for the week ended Aug. 12.

<sup>1</sup> 1923 average = 100; <sup>2</sup> Prepared by Administrative and Research Corp., New York. 1926 = 100; <sup>3</sup> Estimated by J. A. Laansma, Detroit News Editor, AUTOMOTIVE INDUSTRIES. <sup>4</sup> Summarized for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co. of New York.



Weekly indexes of automotive general business charted

## Upswing Starts as Season Opens

same period rose to a new 1939 peak; car loadings numbered 688,591, as against 674,237 in the preceding week and 620,557 a year ago.

Reflecting the suspension of production in important areas, the output of crude oil during the week ended Aug. 26 fell sharply to an average of 1,690,800 barrels daily, as against 3,388,500 barrels a year ago.

Bituminous coal production in the same period averaged 1,267,000 tons daily, as compared with 1,288,000 tons for the preceding week and 1,079,000 tons a year ago.

Professor Fisher's index of wholesale commodity prices for the week ended Sept. 2 stood at 78.4 per cent of the 1926 average, as compared with 78.1 for the week before and 77.8 two weeks previously.

Reserves of member banks of the Federal Reserve system increased \$122,034,000 during the week ended Aug. 30. Estimated excess reserves rose \$60,000,000 to a new peak of \$4,800,000.00.

The General Motors-Cornell world price index of 40 basic commodities for the week ended Aug. 26 was 59.7, compared with the previous week's figure of 60.1. The United States index in gold decreased 0.9 point to 60.2.

GENERAL BUSINESS - ACTIVITY<sup>1</sup> continues to expand. The index of the *Journal of Commerce* for the week ended Aug. 26, again establishing a new 1938-1939 peak, stood at 93.0, as compared with 92.8 for the preceding week and 80.5 a year ago.

Production of electricity by the light and power industry during the week ended Aug. 26 declined slightly from the all-time peak reported for the preceding week but was 10.3 per cent above the comparable 1938 output.

Railway freight movement in the

# New DeSoto Larger

**T**HE 1940 DeSoto is a car of longer wheelbase and greater horse power, restyled inside and out.

Full details regarding mechanical and equipment changes were released just before this issue went to press, but prices will not be announced until about Oct. 1.

The front end of the new cars is of massive appearance, with its wide horizontal catwalk grilles and heavy fenders with inset headlamps of the sealed-beam type. Front and rear fenders duplicate each others curves. Front-door hinges are concealed, hood latches are flush with the surface, and the one-piece rear window is of curved glass and conforms to the outline of the rear panel.

Glass area has been increased throughout the car. Quarter windows have one-third more glass; the curved rear window, 15 per cent more. Front and rear seats are now 51 in. wide, and the headroom has been increased, even though the overall height of the car is less.

As in the other Chrysler lines, there has been a redistribution of weight between the front and rear axles, and the wheelbase has been lengthened. The front axle was moved back 4 in. relative to the engine, the rear axle  $7\frac{1}{2}$  in., which increased the wheelbase  $3\frac{1}{2}$  in., to  $122\frac{1}{2}$  in. This shifting of the axles brought the rear seat farther inside the wheelbase and improved its riding qualities. It also made possible the use of "square-bottom" rear doors in which the windows can be lowered all the way to the sill level.

While there have been no changes in the cylinder dimensions—the DeSoto engine is a six-cylinder of  $3\frac{3}{8}$ -in. bore by  $4\frac{1}{4}$ -in. stroke—engine output has been boosted by an increase in the valve lift. This, of course, called for a camshaft of new design. Engine features continued include full-length water jackets, a water-distributing tube, full-pressure lubrication, stanodized U-slot pistons with four compression rings, a four-bearing counter-

weighted crankshaft, and hardened exhaust-valve-seat inserts.

Changes in frame design have resulted in a lower center of gravity for the whole car. The front cross member is now deeper and stronger, and the angle of the rear kick-up is sharpened. To make the overdrive unit (when used) more accessible, the X member has been moved farther to the rear.

A number of changes have been made in the transmission. Low-speed and reverse gears have a face  $1/16$  in. wider; the straight roller bearings on the counter shaft have been made  $3/16$  in. longer, and the range of motion of the shifting member inside the transmission has been increased to ensure full engagement of the cluster and sliding gears. The shifting arm projects from the transmission at the side, which makes possible a level floor in the front compartment and a simpler hook-up. The synchronizer has been improved. Round shift rails in the transmission are said to make for greater accuracy and uniformity, and the chamfering of the teeth of the low-speed and reverse gears has been improved. The actual motion of the column-mounted shift lever is now less than it was formerly.

Superfinish, the special process developed by the Chrysler Corporation, is applied mainly to engine parts such as crankshafts, pistons, flywheels, camshafts, valve stems, and tappet heads, but the wearing



*The outflaring rear body contours match the fender lines of the new DeSoto coupe.*

# and More Powerful

*The DeLuxe Sedan has sweeping lines that accentuate its new length*



surfaces of the brake drums also have it. One small change in the semi-floating, hypoid-gear type of rear axle is the substitution of a leather for a felt inner seal at the rear-wheel bearing.

Among new conveniences in the equipment may be mentioned a coat-hanger hook incorporated in the assist straps of sedans, an instrument-panel ash receiver of such design that its contents cannot be blown onto passengers, and light ports in back of the tail lights to illuminate the luggage locker. The locker has a wide bottom opening flush with the top of the bumper, which facilitates loading of baggage. The space between the bumper and body is filled with a stone shield. The spare tire is now carried vertically on the right-hand side of the luggage compartment. Other improvements include a trigger-release parking brake placed more convenient to the driver's left hand, ventilating wings which open wider, and rubber sealing completely around the doors. The Safety Signal speedometer is continued, and all of the gages on

the panel now are provided with luminous warning signals.

A new addition to the line of bodies is a convertible coupe in the custom series, with a top which can be raised or lowered by means of engine power. A push-pull control knob on the instrument panel starts the mechanism.

Body types available on the deluxe line are the four-door touring sedan, two-door touring sedan, coupe, coupe with auxiliary seats and seven-passenger touring sedan. The custom series, in addition to the foregoing, includes a convertible coupe and a seven-passenger limousine.

Standard Durasheen colors are black, Bimini blue, Regal maroon, Garland green, Gunmetal, Hawaiian blue, Williamsburg tan, and Pearl gray. A choice of broadcloth or a new type of short-pile mohair upholstery is offered in both the deluxe and the custom series, and all models are available with or without running boards, as desired.



## ***New Styling and Comfort***

# **Features of**

**N**ASH continues its three lines of cars for 1940, with improvements in styling and comfort features. Prices have been reduced by from \$20 to \$50, and a special drive is to be made in the low-priced market, it is announced.

The LaFayette is powered by a six-cylinder L-head engine of  $3\frac{3}{8}$ -in. bore by  $4\frac{3}{8}$  in. stroke (234.8 cu. in. displacement), which with a 6.3 compression ratio is rated 99 hp. at 3400 r.p.m. The car has a 117-in. wheelbase.

The Nash Ambassador Six carries a six-cylinder valve-in-head engine of the same cylinder dimensions as the LaFayette L-head engine, which with a compression ratio of 6 is rated 105 hp. at 3400 r.p.m. The wheelbase of this series is 121 in.

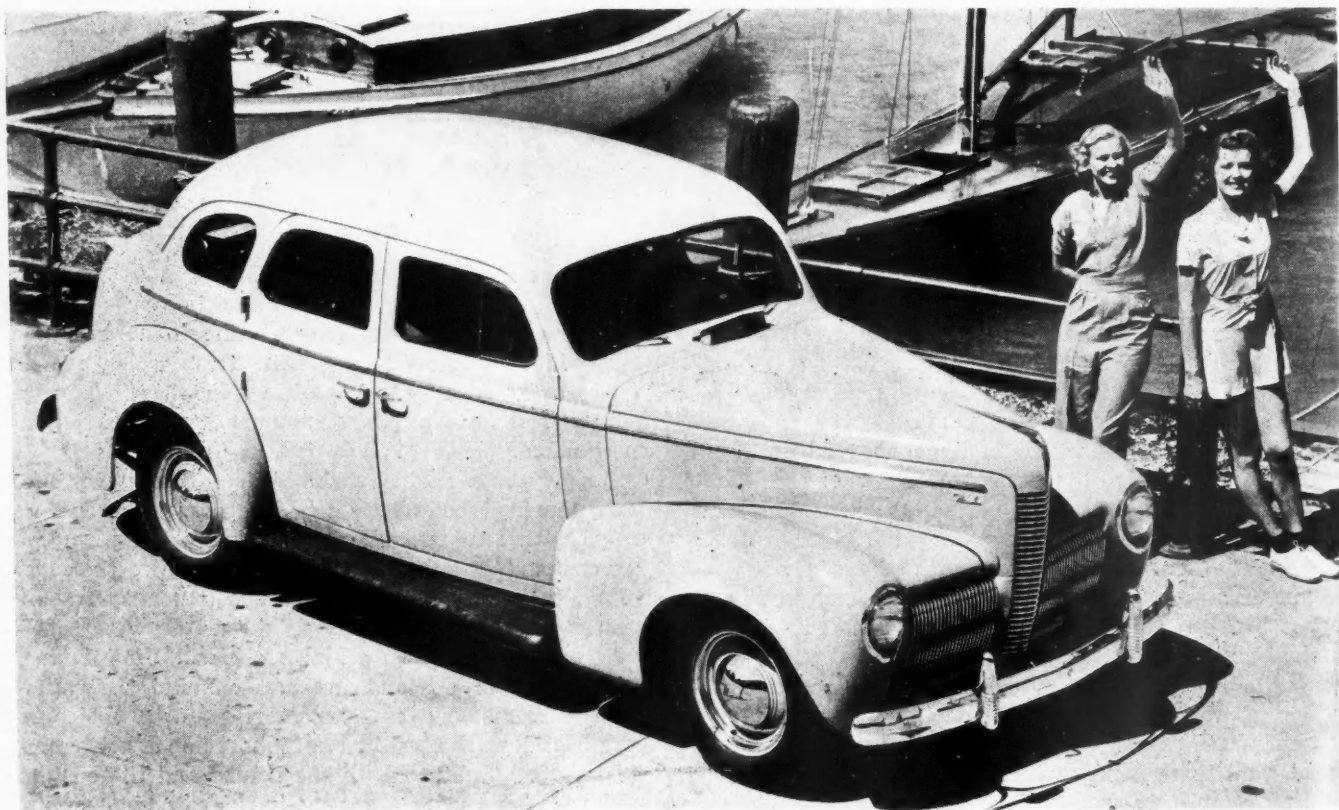
The Nash Ambassador Eight has an eight cylinder valve-in-head engine of  $3\frac{1}{8}$ -in. bore by  $4\frac{1}{4}$  in. stroke (260.8 cu. in. displacement), which with a compression ratio of 6 is rated 115 hp. at 3400 r.p.m. The Eights have a wheelbase of 125 in. Engines of the Ambassador series have twin ignition.

There are six body models in each of the three series. From the mechanical standpoint the most important

change is undoubtedly the adoption of independent front suspension as standard equipment on all three lines. The arrangement is the familiar one with parallel wishbone-type links and coil springs, the latter being of silico manganese steel. Rear springing is by the conventional semi-elliptic springs. The cars also have a new steering system, and turning radii have been reduced. Gemmer steering gears are carried on all series, with a reduction ratio of 18.2 on the two Sixes and 20.25 on the Eight.

New styling is one of the features of the Nash 1940 line. Hoods are long and narrow. At the front there is a narrow, fine-barred, die-cast grille, chrome-finished, which is flanked by two wide die-cast side grilles located in the catwalks. High crowned fenders and a molded edge on the catwalks combine to give the effect of an airplane wing. The sealed-beam headlamps are built into the fenders. Speed lines are carried from front to back, so that the rear fenders, roof and back contribute to the streamlined appearance. Bodies with either the conventional trunk back or a streamlined back are optional.

Automatic overdrives are again offered as optional

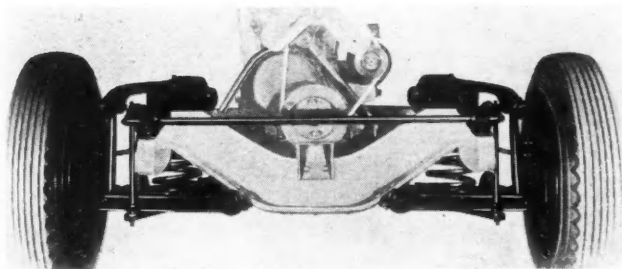


*Nash LaFayette four-door sedan with trunk-back style of body. This shows the new frontal appearance for 1940*

# 1940 Nash Lines

equipment. These are of the new type with which the driver can return to direct drive at any time by merely pressing the accelerator pedal all the way down.

Improvements have been made also in the Nash "conditioned-air" system for winter driving. The "Weather Eye," the device controlling this system, is this year mounted on top of the instrument panel near the windshield. The conditioned-air system comprises an air filter, a fan, a dehumidifier, and a conditioning chamber, the entire unit being located under the cowl. Air is drawn in through the cowl ventilator and passes to the dehumidifier, where it is deprived of excess moisture. It then passes on to a processed filter and then to the warming chamber, where its temperature is raised in accordance with the setting of the control dial. With this system the interior of the car is constantly under a slight over-pressure, hence air can enter only through the ventilator.

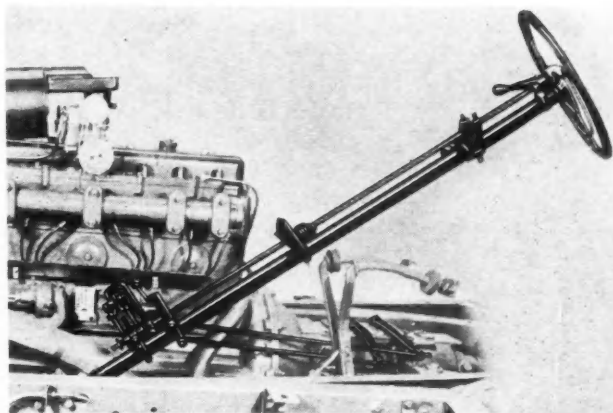


*The new independent front-suspension system, with shock absorbers and equalizer*

A new method of soundproofing, developed with the assistance of engineers of the electric refrigerator division of the Nash-Kelvinator Corporation, is applied to the bodies. It is known as the "Sand Mortex" system of soundproofing. Large quantities of the "sand mortex" are applied to the lower part of body. In mounting the bodies on the frames, use is made of an insulating material known as "Fabreeka."

Nash 1940 cars have column-mounted gearshift levers. These are said to operate noiselessly, because all connections in the shifting mechanism are insulated.

Both front and rear seats in all models are three-passenger seats. The foam-rubber seat cushions introduced last year now are standard equipment on the Ambassador Six and Eight series and extra on the LaFayette series. LaFayette



*Column-mounted shift levers are standard equipment on all 1940 Nash models*

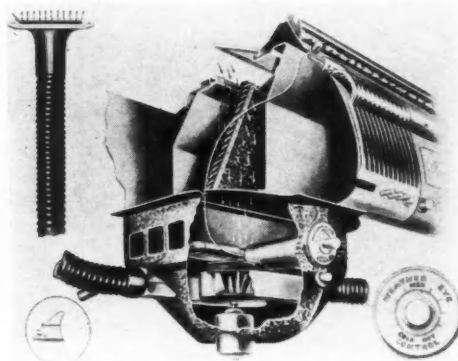
cars will be upholstered in canda cloth, a new fabric produced from wool and kid Angora yarns. Upholstery on the other two series is in broadcloth.

All models have hardware of new design, chromium-finished. Each handle and door lever has a base of translucent plastic, and some of the hardware is tipped with the same plastic material.

Instrument panels also are new and are "done in plastic and chrome." Instruments are recessed behind the clear plastic material, which latter tends to magnify the numerals and to make them easier to read. There are no spokes in the upper half of the steering wheel, so the dials of the instruments are in full view of the driver. There is a chrome-plated grille for a radio receiver at the center of the instrument board. Radio sets with push-button control are available.

Running boards are of the "island" type; that is, they are not connected to either the front or the rear fenders. Hi-Test safety plate glass is employed in the new bodies.

The Nash bedroom car, which has been available for a number of years, is continued for 1940 with improvements. The bed is said to be more comfortable and easier to make up. Besides, the design of the 1940 bodies provides considerable more luggage space.



*Cut-away view of the "conditioned-air" system installed under the instrument panel*

# New Body Styles Grace

**T**wo Dodge lines—the Special with three body styles and the DeLuxe with seven—are being offered for 1940. Sheet metal and bodies are new, and the weight distribution has been changed to approach that of the original Chrysler Airflow.

This change in weight distribution has been brought about by moving the rear axle back  $4\frac{1}{2}$  in. and the front axle 2 in., thereby increasing the wheelbase  $2\frac{1}{2}$  in., to  $119\frac{1}{2}$  in. The new bodies have full-width, straight-sided rear doors permitting easy entry. The floor is now 1 in. lower and the roof  $25/16$  in. lower. All models are available with or without running boards.

Sealed-beam "package-type" headlights are now standard equipment. Headlamps are placed 1 in. higher than previously, so they will throw more light on the road.

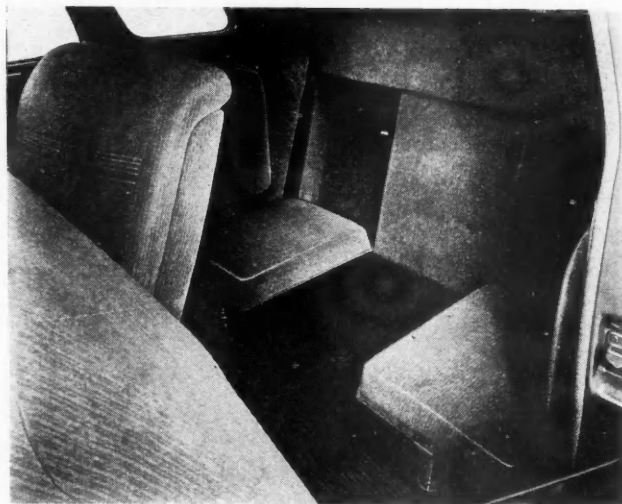
The frame is lower and stiffer, and has a large front cross member. Front suspension has been improved by providing a stronger mounting for the upper control arm and by changing the angularity of the control arms. Tie-rod ends are larger and stronger. A new seal has been provided in the rear axle to prevent grease from entering the wheel bearings.

The engine remains a six-cylinder L-head design of  $3\frac{1}{4}$ -in. bore by  $4\frac{3}{8}$ -in. stroke (218-cu. in. displacement), rated 87 hp. at 3600 r.p.m., with a cast-iron head and 6.5 compression ratio. An edge-type fuel filter is mounted directly at the carburetor. Generator capacity has been increased to 35 amperes, with full voltage-current control.

The size of the counterweights on the crankshaft

has been increased, and this has added to the crankshaft weight. The transmission has been redesigned, and the shift levers now project from the side. The gear-shift mechanism is of the link-type and is housed within the steering column. The shift lever, on the steering column, is a plastic molding with a steel insert, and is in a color matching the interior trim. Gear shifting is facilitated by chamfering the low-speed and reverse gears and by the use of a new type of synchronizer. The faces of the low-speed and reverse gears have been widened.

Front doors are now fitted with concealed hinges. Hancock rotary door latches are used on all doors. Ventilating wings in front doors can be opened to a



*The designers have provided for extra passenger space in the coupe.*

*Four-door Luxury Liner sedan of the new Dodge line for 1940.*





# the New Dodge Lines

*A large luggage space is provided under the sweep of the rear in the Luxury Liner Coupe.*



50 m.p.h., and red above 50 m.p.h. Warning signals are given by the gages in case the fuel supply runs

low, when there is no oil pressure, when the water temperature becomes excessive, and when generator operation is faulty.

wide angle. Rear windows in sedans lower completely. All window glass is of the new high-test safety plate type. The rear window is a large single piece of heat-tempered glass, curved to conform to the outline of the back panel. The license-plate light, luggage-compartment lid handle, and lock are combined in a unit. The tail lamps, which are mounted in the body panels at the sides of the luggage-compartment opening, extend through to the compartment and light it up when they are on.

The spare wheel and tire are mounted vertically on the right side of the luggage compartment and can be easily removed. Another advantage of carrying the spare tire in this position is that the inflation pressure can be easily checked.

A gravel deflector between the rear bumper and the body prevents marring of rear panels by stones. It is not fastened to the body and is designed to slide under the body in case the bumper is struck.

Safety signals are incorporated in the speedometer and all gages. The speedometer at night shows a green light at speeds up to 30 m.p.h., amber from 30 to

low, when there is no oil pressure, when the water temperature becomes excessive, and when generator operation is faulty.

On the deluxe models two-speed electric windshield wipers are fitted. An automatic circuit breaker opens the circuit in case of an overload, and automatically closes it again when the overload is eliminated. Other special features of deluxe models include certain interior refinements such as assist cords, robe cord, ornament on door window garnish molding, a scuff carpet at the bottom of door-trim panels, plastic escutcheon plates, and sponge-rubber sealing around all doors; also an 18-in. steering wheel with horn ring, 10-in. hub caps, lining of sides of luggage compartment, tapered ends of leafs of rear springs, metal covers for rear springs, a torsional-vibration damper on crankshaft and a stabilizer at the front end of the car.

The three body styles of the Special line are a coupe, a two-door and a four-door sedan, while the DeLuxe line of bodies includes a coupe, coupe with auxiliary seats, convertible coupe, two-door and four-door sedans, a seven-passenger sedan, and a limousine.

NEW CARS



1940 Willys Deluxe Coupe

**W**ILLYS-OVERLAND enters the 1940 market with three lines of cars mounted on the same chassis—the deluxe coupe, and sedan, the coupe speedster, and the Speedway coupe and sedan. Of these the last-mentioned is mechanically identical with the deluxe models, but it is lower-priced and comes without the special deluxe features. All models will be available with or without running boards. An optional feature is a trunk lid which provides additional luggage space.

Although the body shell is substantially the same as last year's, the front-end has been completely remodeled. Front-end style features include a new chrome-plated grille, flanked by graceful fenders with inset headlamps. The conventional headlamp design is continued, standard pre-focused bulbs being used. This is referred to as the Overland safety headlamp. There is a strip of chromium plate extending from the tip of the hood to the rear.

An overdrive unit now is offered as an option on all models and is said to make possible a fuel mileage of 40 to the gallon.

The principal mechanical specifications remain the same, except for detail changes to be noted later. The car has a wheelbase of 102 in. The engine is a four-cylinder L-head of  $3\frac{1}{8}$ -in. bore

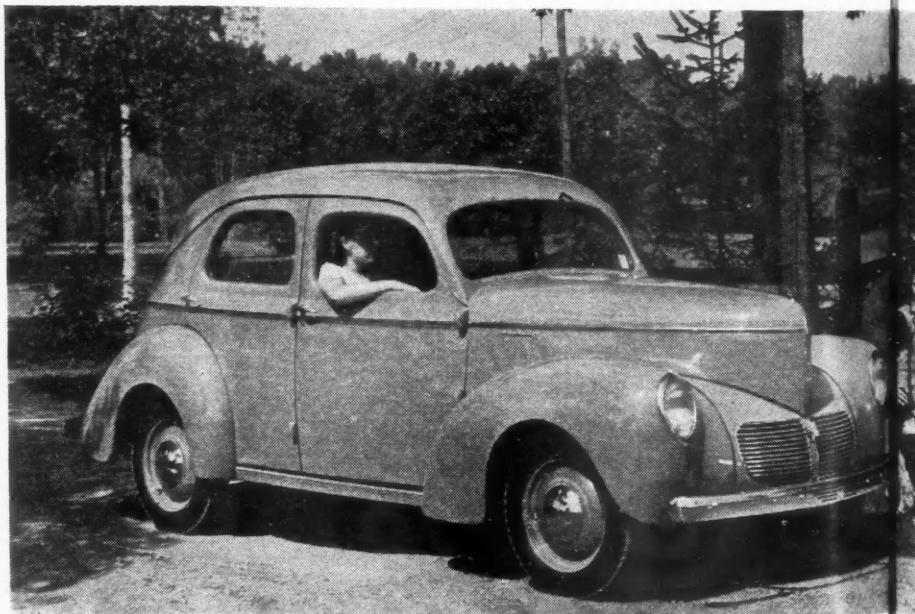
## Willy's

by  $4\frac{3}{8}$  in. stroke (134 cu. in. displacement) and is rated 61 hp. at 3600 r.p.m., with cast-iron head and the standard compression ratio of 6.45. This is a slight increase over the compression ratio used last year. Two optional cast-iron heads are offered for standard models, one with a compression ratio of 6.1, for export to countries where poor grades of fuel must be figured with; the other with a compression ratio of 6.8, for use in high altitudes. The coupe speedster, the new higher-speed sports model, will have an

aluminum cylinder head with a compression ratio of 7.1, giving an output of 65 hp. This model will have a rear-axle ratio of 4.33.

Because of the higher engine speeds—a top speed of around 5000 r.p.m. in the speedster—the standard engine now is provided with a counter-weighted crankshaft, which keeps down the bearing loads.

Several major changes have been made in the powerplant. A Carter, plain-tube, automatic carburetor will be standard equipment. A new type of simplified, fully-ventilated clutch, developed by the Atwood Vacuum



# Opens Season with Three Lines

***Five models on 102 in. wheelbase with improved powerplant and cooling system. Remote control is offered on deluxe line.***

Machine Co., is standard equipment. It is of 8-in. nominal size and has the Borg & Beck driven disk.

Piston rings remain the same, but the expander under the oil-control ring has been eliminated. An improved timing-gear chain has been adopted. The air cleaner is now flexibly mounted by means of a rubber connection. The generator is of increased capacity and has voltage regulation.

Cooling has been improved by the use of a new and more durable radiator core. This, in combination with a larger radiator-grille area and scoops at the front end, decreases the water temperature at least 5 deg. at high speeds and 11 deg. or more at a speed of 20 m.p.h.

To allow for the higher speeds of which the car is capable, the fuel-tank capacity has been increased to 10½ gals.

While the transmission remains the same, deluxe jobs will have a "remote-control" shift by means of a lever mounted on the steering column. A small-model Warner-Gear overdrive will be offered as an option on all models.

The steering gear, which is new, features the well-known Gemmer ball-bearing, roller-tooth mechanism, and is combined with a conventional linkage. It is used in conjunction with a new steering wheel having

only two spokes, offset below the hub, thus affording a two-hand grip on the spokes instead of on the rim.

Front springs are 2½ in. longer than last year, and their rate is correspondingly lower. Parabolic-section leaves are used for both front and rear springs, with pointed ends on the top leaves. Spring clips are now rubber-encased.

Shock absorbers incorporate detail changes making for improved performance and greater durability. At the front the rubber biscuits, formerly used for attachment to the front axle, have been replaced by an encased eye.

Rear axle and frame remain the same. Bendix hydraulic brakes are now fitted, in drums of the same size. These brakes comprise separate shoes with double anchor attachment.

While the body shell remains the same, one inch additional headroom is provided at the rear seat. A new seat and seat-back construction is employed on all models, a special "zig-zag" cushion-spring design being used which eliminates coil springs. This reduces the thickness of the seats and backs, thus providing more room, and it reduces the weight by as much as 28 lb. Seat frames are of tubular construction, which gives more leg room for the rear passengers.

Pivoted ventilators in front windows are standard equipment in deluxe models.

All models have new instrument panels and feature a novel two-tone upholstery treatment. As mentioned previously, all models are offered with or without running boards.

## Testing Rubber Compression

WHERE rubber is used as an elastic suspension medium its damping factor is an important characteristic. When a rubber body is deformed it does not show quite as high a resistance during recovery as during deformation and if the resistance is plotted against the deformation for an entire cycle, the familiar hysteresis loop is obtained, the area of which is a measure of the energy absorbed in overcoming molecular friction. Dr.-Ing. H. Gelling recently made some tests on blocks made of various grades of rubber which were subjected to cycles of compression by means of an eccentric press. The rubber block rested on a pressure-sensitive device comprising a number of quartz crystals, and the pressure transmitted to these crystals through the rubber was indicated by means of a cathode-ray tube. It was found that the hysteresis increases rapidly with a drop in temperature below the freezing point. Among the grades of rubber studied were two of tire-tread stock, one of natural rubber and the other of artificial rubber. It was found that within the temperature range between about minus 20 and plus 140 deg. Fahr., the damping factor of the synthetic rubber was approximately 20 per cent lower than that of the natural rubber. This is thought to explain in part the greater durability of the synthetic rubber as compared with the natural product.

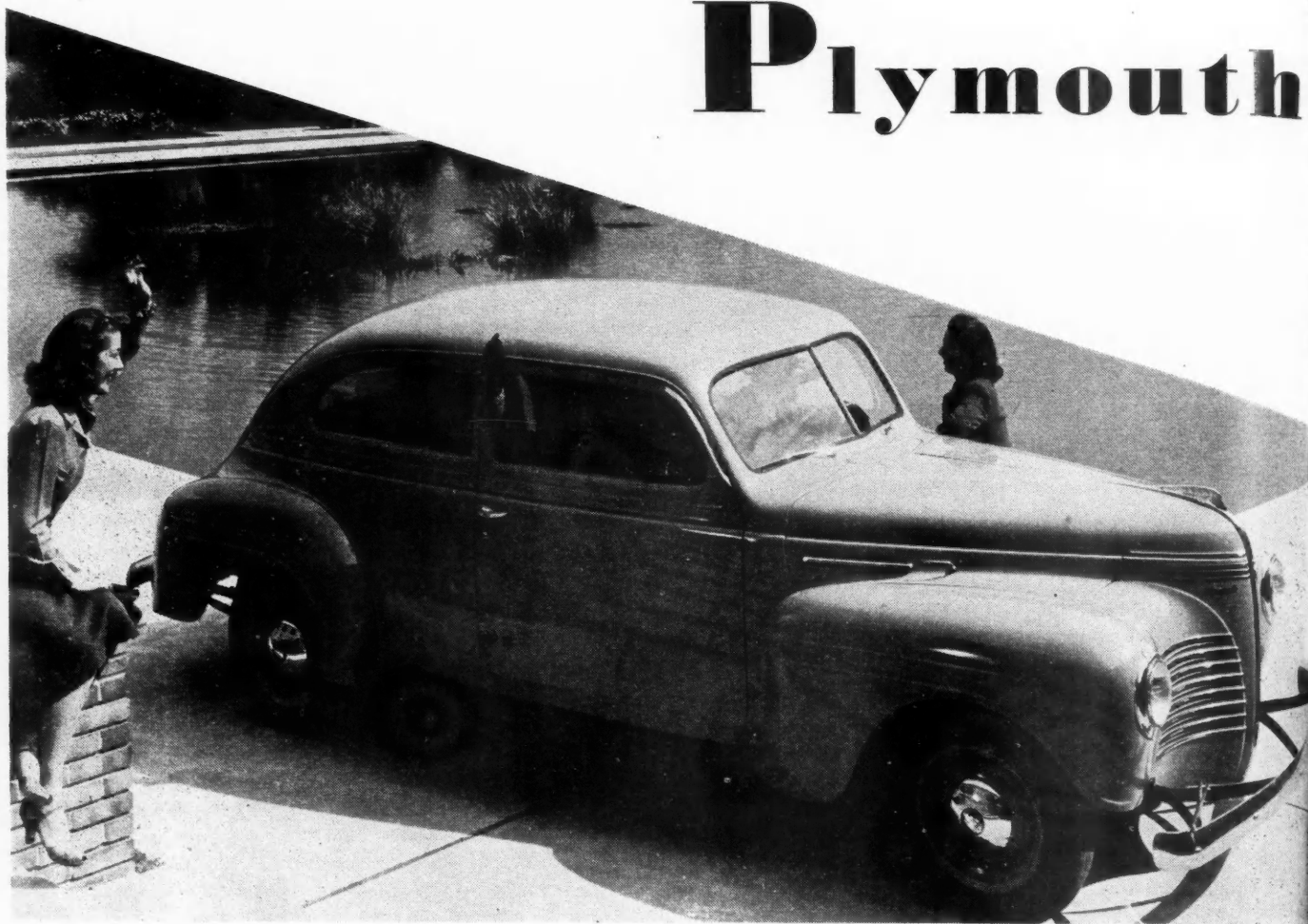
NEW CARS



*Speedway sedan is a 1940 Willys offering aimed at the low price field*



# Plymouth



*Plymouth's "Roadking" two-door sedan has a lower body and longer wheelbase than last year's models*

**M**ANY changes have been made in the Plymouth for 1940, which has a longer (117-in.) wheelbase and is larger than its predecessor, containing 12 cu. ft. additional inside space. The weight has been redistributed by shifting both axles farther to the rear—the rear axle more than the front. Other new features include wider vision through the new type safety glass, sealed-beam headlights, an improved column-mounted shift lever which is now standard on both the Roadking and the DeLuxe; superfinish of certain engine parts, a new transmission designed to facilitate remote control, and "reminder" safety signals on all instruments.

All body styles this year come either with or without running boards. When without running boards, the cars come with fender guards and a chrome-decorated molding below the doors. Bodies are wider and longer, and they now flare out at the bottom instead of curving in.

Body lines flow in continuous curves to include the fender, hood, and radiator shell, and end at the back in a rear deck that slopes at 45 deg. The latter conceals the trunk, which is lighted up at night by inside windows back of the two tail lamps. This year's grille is more nearly a solid section in body color, broken only by a bright metal center strip and three decorative louvers on each side, close to the chromium belt. The lower grille is much larger, with larger ventilating sec-

tions, the area through which air flows to the radiator core being 270 sq. in. larger than last year.

Both front and rear fenders are larger, higher at the crown, and drawn out over the wheels to emphasize the length of the car. This style theme is repeated in two parallel "speed lines" on each fender directly over the wheel. Front fenders curve inward and up to form the hood sides. The hood is broader at the cowl, and the top panel extends forward 13 in. farther at the belt, as it now curves without a break at the radiator core and down to meet the grille. Only the top of the hood is lifted for service, the same as last year. Streamlined into the front-fender contour are the sealed-beam headlamps.

Driver's vision is improved by the higher and wider windshield and the one-piece curved-glass rear window that follows the contour of the rear panel. There is 95 sq. in. more glass in the windshield, and front-pillar sections have been made smaller to reduce the "blind spot." All windows in the car are larger this year.

Rear doors are straight, with the cut-out usually necessitated by the rear wheelhouse eliminated, and both the Roadking and the DeLuxe this year have the rotary type door latch. Front-door hinges now are concealed. Windshield wipers now are mounted at the base of the windshield; they are vacuum-operated. A rear-deck stone shield, mounted between rear bumper and body, is standard equipment on all Plymouths this year.

# Opens '40 Season

The interior color scheme is a light shade of walnut brown, with color accents of coach vermillion at the horn button and on all instrument dials. Further color contrast is gained by the use of a luminous buff, in the plastic escutcheon plates and in the Plymouth nameplate on the instrument board of DeLuxe models. A chromium horn ring replaces the horn button.

The front seat has 4 in. more hip room than last year, and additional shoulder space has been provided between door pillars. Although the roof is lower, there is 3½ in. more front-seat headroom, as the floor also has been lowered. Rear seat cushions also are 5 in. wider at the edge, with 2½ in. more hip room between

The aluminum-alloy pistons now are tin-plated to protect both the pistons and the cylinder bore during the running-in period. An oil filter is now standard equipment on all models.

Brake drums are superfinished, and the brake linings are ground to a high finish.

The transmission now has its cover located on the side instead of on top, which permits of a lower floor in the driver's compartment. Column-mounted shift levers are standard on all models. The remote-control mechanism has been improved, and the shift lever now has a shorter throw. A feature of the new transmission is an improved blocker mechanism. The clutch this year has a lighter driven disc, and there are big ventilating outlets in the clutch housing.

Offered as optional equipment this year is a twin-unit all-weather "Aircontrol" system. Fresh air from outside the car is filtered and heated, and then distributed through the interior of the car through suitable ducts. Seven different adjustments are possible with this system, which is claimed to provide equal comfort for front and rear-seat passengers.

The instrument panel and window moldings are finished in a lustrous walnut grain. This year's inside decoration motif is a reed pattern of parallel chrome lines on the instrument panel, which is repeated on window moldings and in the upholstery.

Mohair upholstery is standard in Roadking bodies, while in DeLuxe models buyers have the choice of mohair and broadcloth. Upholstery is tailored in a three-pillow design. Front and rear center pillows in the DeLuxe are trimmed with narrow vertical pleats that repeat the reed pattern of the decoration scheme. Upholstery of the door panels is similar in style, with a small reed design

in the top half of the panel, set off by horizontal style lines below the molding and above the kick-pads. Rear compartments have deep pile carpets in sable brown, and foot rests in this compartment have been redesigned for greater comfort.

The instrument panel is 3 in. longer this year, and the glove compartment at the right has been widened. All instruments and controls remain at the left, leaving the center of the board free for a radio receiver. If a radio is installed, all controls and automatic station selector buttons fit into the vertical panel at the left of the grille, where they can be easily reached by the driver. A corresponding vertical hinged panel



*New Plymouth front with "Sealed Beam" headlamps*

arm rests.

This year the engine has been moved 4 in. forward with relation to the front wheels, and the rear axle has been moved back 7 in. This brings the rear seat completely ahead of the axle, which improves the ride.

Frames are new and heavier this year, and they are so designed as to bring down the floor level of the car, lowering the center of gravity.

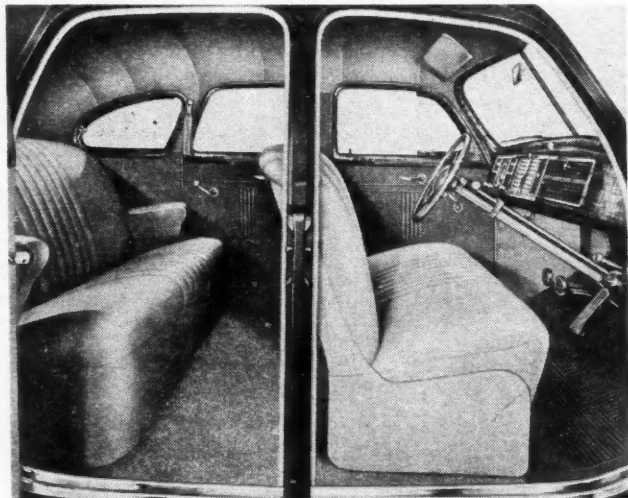
Springing is by coil springs in front and leaf springs with thinner, longer leaves in the rear. Spring-action is controlled by direct, double acting shock absorbers at all four wheels. Body insulation has been further improved.



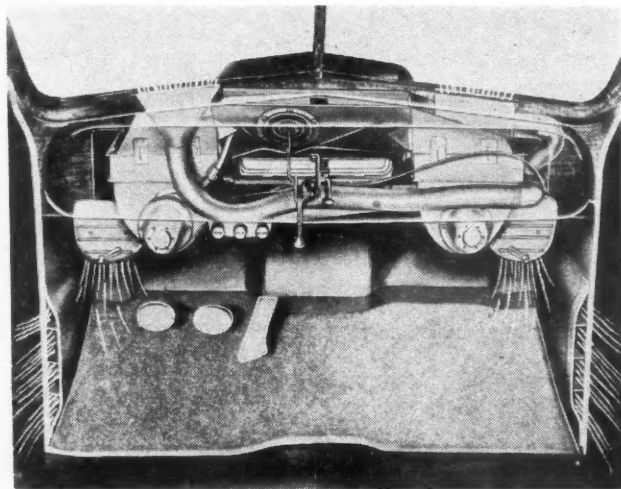
at the right of the grille conceals a recess for an ash tray and cigar lighter.

The safety-signal speedometer is continued, and this year "reminder" safety signals have been added to all other instruments, which flash a warning red light when the fuel supply is running low, the oil pressure is low, the battery is approaching the point of discharge, or the engine temperature becomes excessive. The headlight switch has been moved up on the instrument panel, to eliminate the former sub-panel, thus providing additional knee room for the driver.

In four-door models another ash tray is built into



The "dog leg" has been eliminated in rear door of the 1940 Plymouth sedans



Phantom view of the all-weather air control system. Seven adjustments control the operation.

the back of the front seats, while in Roadking two-door sedans it is mounted on the right-side quarter panel and in DeLuxe two-door bodies in each quarter panel. The dome light is located back over the rear curved window and has a special lens that provides good illumination throughout the car.

The new cars are finished in high-luster enamels. Before the finish colors are applied, the all-steel bodies are completely rust-proofed. Standard colors for 1940 include Airwing gray, Gunmetal, Boatswain blue, Aviator blue, Amphibian green, Hampton beige and black.

## Design Problems of Trans-Atlantic Airplanes Are Discussed

**D**ESIGN problems of trans-Atlantic airplanes were discussed in a paper by Dr. Robert J. Nebesar, chief engineer of the Avia Aircraft Corp., Prague. The author said that there had been considerable discussion of the practicability of large trans-Atlantic seaplanes, but that little had been written regarding the use of landplanes in a trans-Atlantic service. He considered the chances of safely completing the journey as equal for both types of ship, the factor of safety being dependent mainly on the use (in both types) of multiple engines accessible during flight and on such a design that the flight could be continued with only one-half of the engines functioning. One advantage of the landplane over the seaplane would be that passengers could embark and debark at the regular airports, instead of at sea, possibly under rough weather conditions. He thought the cruising speed for such a trip as from New York to Paris should exceed 200 m.p.h., assuming that passengers would prefer a short trip with less comfort to a longer one under more luxurious conditions on a seaplane.

Data were given for two projected trans-Atlantic airplanes referred to as TA-1 and TA-2, respectively.

On long trips these would carry 48 passengers, while the maximum passenger-capacity would be 58 for each ship. Four powerplants of 1800 hp. each were provided for, with a take-off rating of 2100 hp. each. The gross weight would be 102,000 lb. in the case of TA-1 and 115,000 lb. in the case of TA-2. The aggregate cruising hp. would be 4800. For a trip of 4000 miles the TA-2 would have to carry 48,000 lb. of gasoline and oil, this allowing for a 20 per cent reserve. For a trip of 2650 miles for the TA-1 and 3640 miles for the TA-2 the total operating cost is figured as \$1.25 per mile for the former and \$1.33 for the latter, equivalent, at the assumed speeds, to \$272.34 per hour for the former and \$286.07 per hour for the latter. In arriving at these figures it was assumed that the cost of the complete plane was \$600,000, the cost of the engines being taken to be one-fourth that of the complete plane, or \$37,500 for each nacelle. For the TA-1 project the operation cost was figured for the trip from Los Angeles to New York, 2650 miles, while for the TA-2 it was figured for a New York-Paris trip, 3640 miles.

Paper presented at the SAE World Automotive Engineering Congress.



# A Hundred Dollar Trip for a Dollar or Less

**T**HOUSANDS of automotive executives who have included the Machine Tool Show on their personal visiting schedules for the period Oct. 3 to 13 will find in the pages of the Oct. 1 issue of *AUTOMOTIVE INDUSTRIES* their best substitute for such a visit, now made impossible by cancellation of the Machine Tool Show dates for the duration of the present emergency in Europe.

Advance material now in the possession of *AUTOMOTIVE INDUSTRIES* shows conclusively that new developments in machine tool design add up to a staggering total of technical achievement. A machine tool show showing this achievement in concrete form, under a single roof would unquestionably have been one of the most dramatic exhibitions of technical progress in a decade.

From the standpoint of the production man and the tool engineer, the dramatic aspect of such a show naturally takes second place to the practical aspects of utility. What will the new machines do? How will they save production costs? What new design features do they include?

These questions will be answered in complete and authentic detail in a section of the Oct. 1 issue of *AUTOMOTIVE INDUSTRIES* to which every machine tool

manufacturer who planned to exhibit at the Cleveland show, and scores of others who did not, have been invited to supply technical information about their new products.

Cancellation of the Machine Tool Show does not diminish the wealth of information about new machine tools which will be available to every reader of *AUTOMOTIVE INDUSTRIES* in the Oct. 1 issue. In fact, under the circumstances, we are planning increased last-minute effort to assure a maximum of information about new tool developments.

Elsewhere in this issue will be found a statement of the reasons underlying the cancellation of the Machine Tool Show in Cleveland on Oct. 3. Virtually the whole machine tool industry will be finding 24 hours a day a small number in which to execute business on hand. Normal domestic requirements, it is obvious, would be ordered as early as possible for shipments to be made within a normal interval. Many an industrial order from the automotive industry will have its beginning from a careful study of the new machine tools presented in the Oct. 1 issue of *AUTOMOTIVE INDUSTRIES*. It is reasonable to say, therefore, that the Oct. 1 issue assumes a double importance for every reader, and every potential advertiser.

## New Developments In

# AUTOMOTIVE

### New Fabric for 1940 Cars



P. B. Baldwin, general sales manager (left) and W. F. Bird, director of research and technical control for Collins & Aikman Corp., examine a piece of canda cloth, new type of automotive upholstery fabric developed by the company for the 1940 cars. It will be available in most of the new models. (See "Upholstery Fabrics Are Engineered Too," by Herbert Hosking, AUTOMOTIVE INDUSTRIES, Oct. 16, 1937, p. 512.)

### Carboloy Announces New Titanium Carbide Grade

Carboloy Co., Inc., Detroit, has announced the development of Grade 78, a special carbide containing a combination of tungsten, tantalum and titanium carbides. Grade 78 is said to represent a marked improvement over titanium carbide grades introduced by the company during the past few years. It is used for taking cuts as heavy as  $\frac{3}{8}$  in. with feeds up to  $\frac{3}{64}$  in. per revolution in the machining of steel bars and castings.

A typical example of the results being obtained with Grade 78 is shown by its use for finish turning 11

steps on an SAE 1045 steel shaft 35  $\frac{3}{16}$  in. long, steps varying from 1  $\frac{1}{4}$  in. diameter to 2.78 in. diameter. This operation was previously performed with high speed steel tools with floor to floor time of 33 minutes per shaft. A grade 78 style 4 Carboloy tool now completes the operation in 18 minutes, a 45 per cent reduction in machining time. This does not include the saving in down time and grinding time due to longer tool life. Speed used is 180 f.p.m., with feed of 0.020 in. per revolution.

J. R. Longwell, chief engineer of Carboloy Co., in explaining the use of titanium carbide for metal cutting tools, stated that it is used principally in conjunction with tungsten carbide.

"Tungsten carbide," Mr. Longwell pointed out, "is today the basic metal used in all cemented carbides. Titanium carbide, or tantalum carbide—in relatively small amounts—are added to the basic tungsten carbide metal for machining applications—such as steel cutting—where the lubricating and other properties of tantalum and titanium appear to be desirable."

### Electrode Gives Smooth Welds for Finish Beads

A new arc welding electrode, which will facilitate finishing operations on welded products by eliminating the need of dressing or smoothing welded seams in many applications, has been announced by the Lincoln Electric Co., Cleveland.

The new electrode, known as "Fleetweld 10", is designed particularly for finish bead welding on "U" groove welding in downhand position. The electrode is said to provide full slag coverage and a weld deposit of exceptional smoothness. The bead is uniform and regular without square shoulders. The metal smooths out evenly during welding and the line of fusion with

*Automotive*  
**MATERIALS**

31

# MATERIALS . . .

***A new fabric for automobile upholstery, a special carbide for heavy cutting, a welding electrode that will facilitate the finishing of welded seams and a line of tool blanks that are extremely hard and adapted to fast cutting, all bid for the attention of automotive engineers.***

the base metal is practically unnoticeable. Finish beads can be made in V-butt joints in flat position which are flush with the surface of the plates. The surface of the bead made with the electrode has much less of the "rippled" effect which characterizes the usual weld deposit.

The Lincoln company suggests that, by employing the electrode for the final bead on joints where smooth finish is required, many manufacturers will be able to save the time and labor formerly required to "dress" the welds. In other cases, where the nature of the product requires grinding, buffing and polishing to assure the maximum in appearance, the finishing work will be simplified as far as the welded seams are concerned.

"Fleetweld 10" can be used with either normal or reverse polarity with D.C. current, or with A.C. It is made in two sizes in 18-in. lengths, 1/4-in. and 5/16-in.

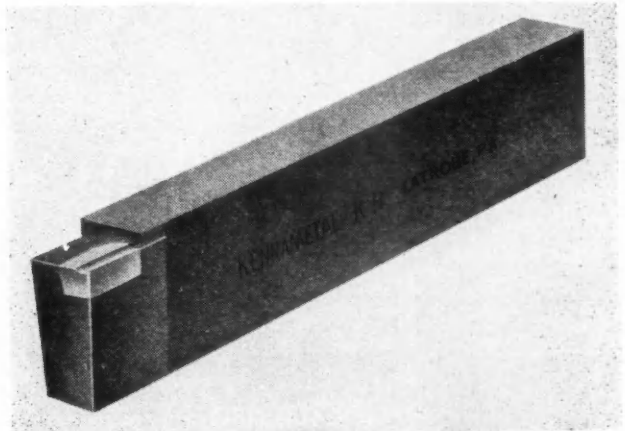
## **New Tool Metal for Machining Hard Steels As Well As Annealed Stock**

Discovery of an intermetallic compound, Tungsten-titanium carbide, corresponding to the formula  $WTiC_2$ , and having a hardness inferior only to the diamond has resulted in a series of steel-cutting hard alloys used for machining steel. These metal-cutting alloys are marketed in the form of tool blanks for tipping milling cutters, counterbores, broaches, and reamers, as well as in completed single point lathe and boring tools manufactured and sold by the McKenna Metals Co., Latrobe, Pa., under the trade name Kennametal.

Kennametal grade KH has a hardness of 91 Rockwell A (78 Rockwell C) and a strength, on transverse rupture tests, of 224,000 lb. per sq. in. Thus it is harder than the hardest tool steel and 60 per cent as strong as hardened tool steel. Grades KM and KS,

while a little softer, have strengths up to 75 per cent of steel. All are much stronger than melted cobalt chrome tool alloys.

Kennametal is used in machining steel, both heat treated and annealed. It does not take the place of tungsten carbide for machining cast iron, bakelite, hard rubber, wood and glass, where the material being machined is of low tensile strength and a poor heat conductor, and the chips are crumbled. Kennametal is also used in machining Monel metal, including the hardenable varieties, Hadfield manganese steel, and



**Style No. 1 Kennametal tool with chip breaker ground on cutting surface.**

other tough alloys cutting with tough coiled chips.

Speed of cutting with Kennametal tools is said to be twice to six times the speed for high-speed steel tools on the same work. Depth of cut and feed are limited only by the horsepower available, and the mechanical set up.



# Construction of the Antarctic

**T**HE Antarctic "Snow Cruiser," main cog in the government's South Polar claim-laying project is rapidly taking shape at the plant of the Pullman Standard Car Mfg. Co. The framework of the 4-wheel monster is fully completed and the application of the outer steel skin is proceeding rapidly.

Design and construction of the 55-foot snow traveler was directed and carried out toward one highly desirable end—to obtain the strongest possible structure with least possible weight. Each two pounds of added weight means a sacrifice of one mile in cruising range. High tensile steel structural members, fused into one single homogeneous structure by the modern shielded arc process of electric welding is the type of construction selected. Lincoln Electric Co. equipment is being used. If conventional riveted construction had been employed the weight would have been increased by approximately 4800 lbs.

Construction of the "Snow Cruiser" consists of fusing together a great number of structural mem-

bers, cut, formed, fabricated and fitted to the design. The work began with the laying of the 5 longitudinal strength members which are standard 12 inch I-beams, slit lengthwise of the web, vee'd to a taper, then are welded to provide one-piece members. From this point, construction became a matter of assembling the structure a part at a time, first tack welding each additional part into the structure until alignment could be checked and then permanently fusing the parts into the whole. Approximately 550 pounds of electrode will be required for construction.

Arc welding will also be an extremely important adjunct to the polar vehicle's permanent equipment, for a generator of 200-ampere capacity, fitted for belt drive, will be permanently installed. It will be a necessary tool for the Cruiser's machine shop where it will be used for repairs, structural parts, or the fabrication of miscellaneous devices and equipment. Indispensable in many ways, the equipment may be used for charging batteries and for supplying power to

raise or lower the wheels. It may also prove an aid in case of emergency since it can supply current for lighting or for operating tools, even starting the Diesel engines with which the "Snow Cruiser" is to be equipped.

The Cruiser was designed by the staff of the Research Foundation of Armour Institute of Technology, Chicago, as a fundamental research project under the direction of Dr. Thomas C. Poulter, scientific director, who was second in command and senior scientist of the Byrd Antarctic Expedition II.

The craft will carry provisions for one year for a crew of 4 men, will carry a complete scientific laboratory and will make it possible by means of an airplane transported on its top deck, to explore a strip of territory 600 miles wide. Capable of traversing 15 foot crevasses, propelled by any one or all four of individually driven wheels, the "Snow Cruiser" unit will be able to map and explore in one month more territory than all previous expeditions combined.

A. F. DAVIS, Vice-President,  
The Lincoln Electric Co.

**T**HE entire operation of the unit will be handled from the control room by one man. The wheels are independently adjustable vertically four feet and are operated from the control room. This makes it possible to raise the cruiser so that the lower surface clears the snow by nearly 4 feet or

Photo courtesy Lincoln Electric Co.

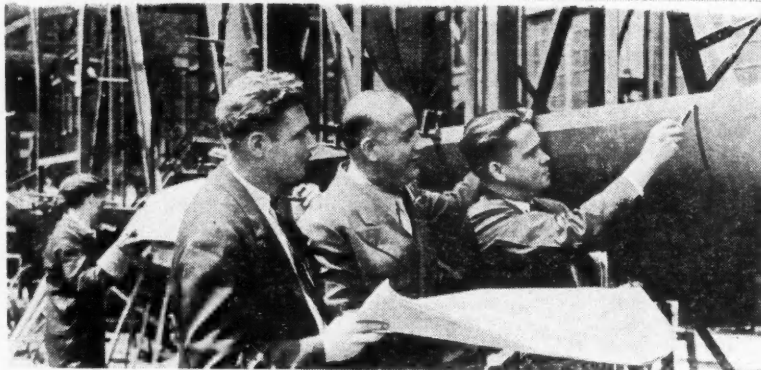
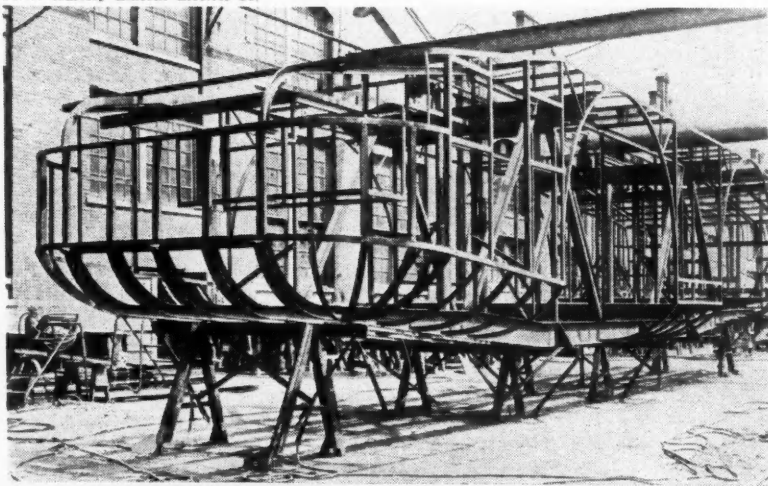


Photo courtesy Inland Steel Co.

(Top) The "Snow Cruiser" in the early stages of construction showing Dr. F. A. Wade, Dr. T. C. Poulter and Harold Vagtborg inspecting the frame and sheeting

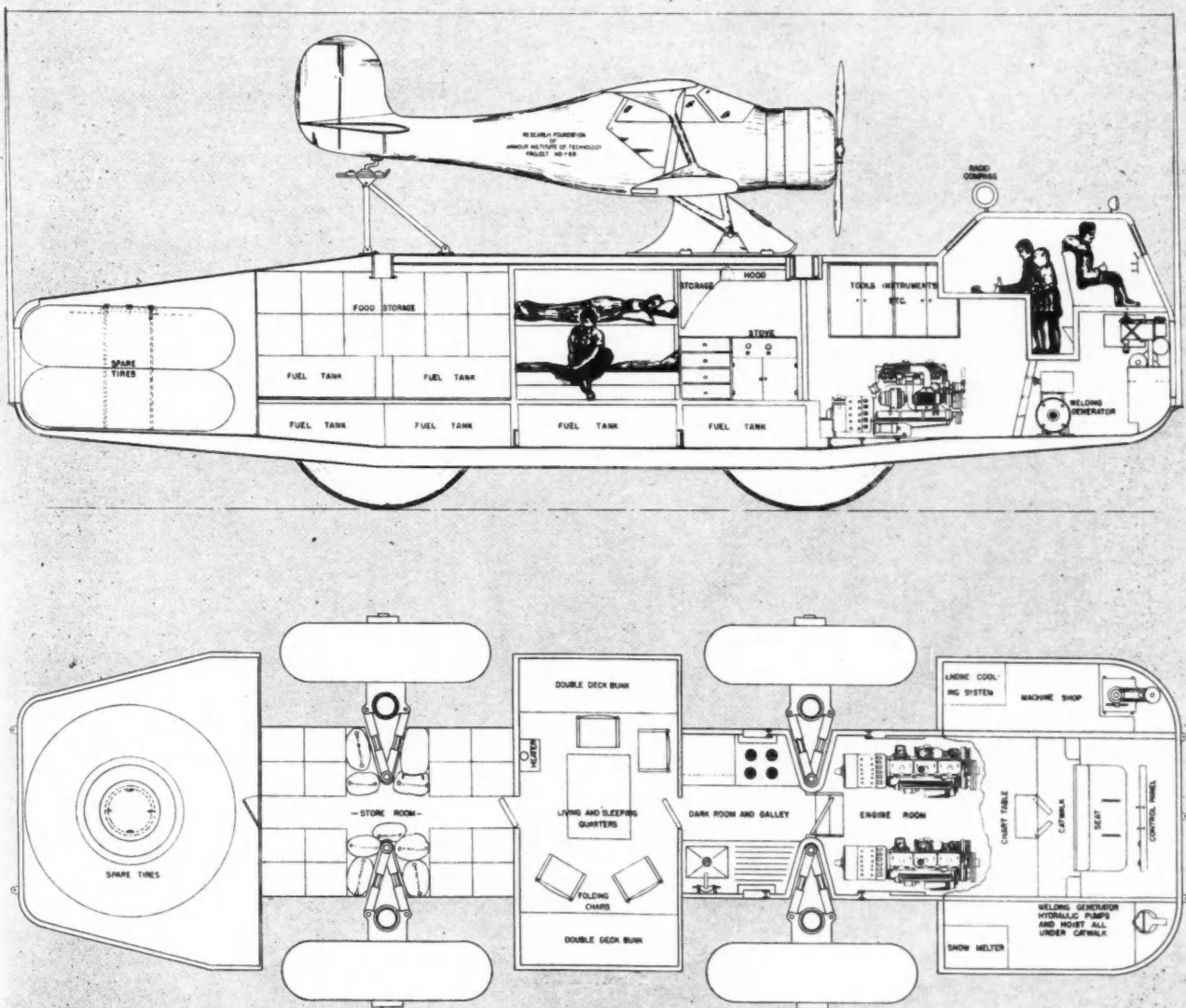
# Snow Cruiser

it can be set directly on the snow surface. By means of this feature the Snow Cruiser can cross a 15-foot crevasse by driving the unit forward until the front wheels come up to the edge of the crevasse. At this point the forward end will overhang the opposite side of the crevasse sufficiently so that by lowering it on the snow and by means of traction on the rear wheels the front end can be slid on the snow until the front wheels have crossed the crevasse and the rear wheels approach it. The load will then be taken up on the front wheels and the rear wheels retracted so that the after end of the unit trails on the snow. With the

traction on the front wheels the Snow Cruiser then can be driven forward until the rear wheels have crossed the crevasse, at which time the rear wheels can be extended and the cruiser proceed on all four.

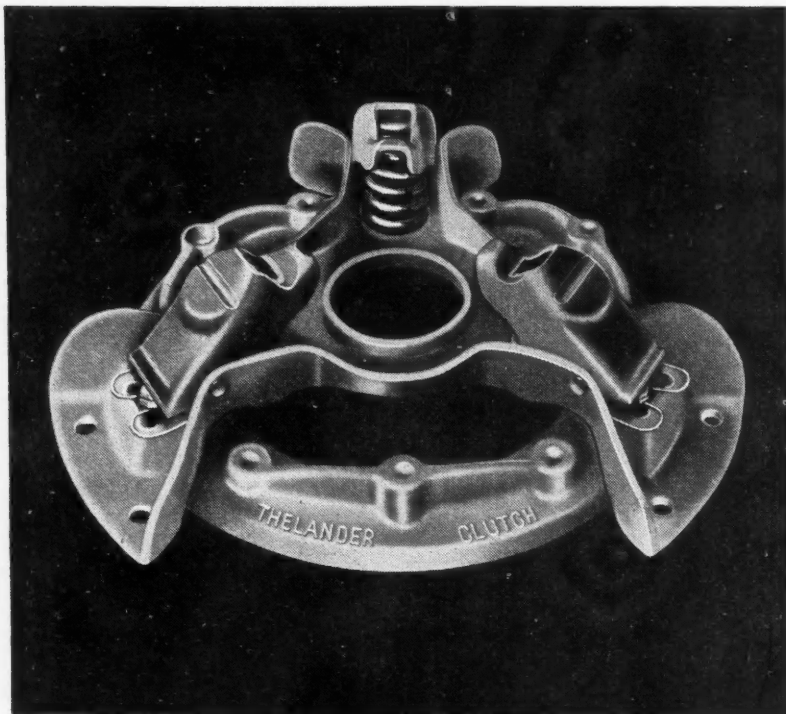
Riding "picka-back" on the Snow Cruiser will be the five-passenger plane which will have a cruising speed of 177 miles per hour and a cruising distance of 1,500 miles with four men. It will, therefore, be possible for the crew to reach the coast from any point on the continent. However, the main purpose of the plane will be aerial mapping and reconnoissance. The air-plane can be unloaded and prepared for flight in ten minutes, and loaded again in the same short span of time.

The design of this Snow Cruiser centers upon experience gained during the last Byrd Antarctic Expedition which showed that special consideration must be given to construction materials which will withstand low Antarctic temperatures. Inland Hi-Steel was selected for the entire frame structure; wheels, floor plates, and the outside sheathing that will cover the runners.

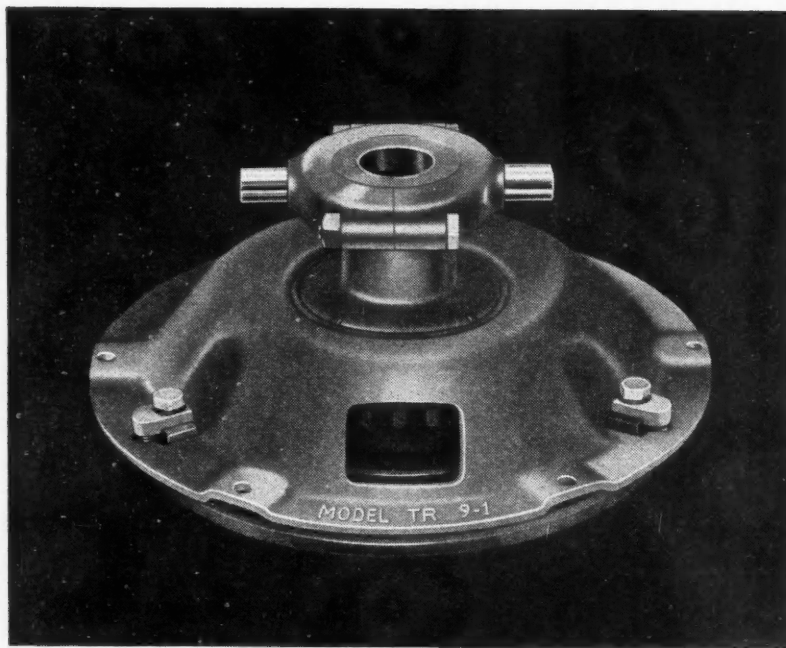


Courtesy Lincoln Electric Co.

Elevation drawing of "Snow Cruiser" showing living quarters, control room, etc., above and plan below



*Pressure plate and spider with springs and levers and at right the clutch disc built up of three segments and hub by riveting*



*Constant-pressure-type clutch*

**T**HE Atwood Vacuum Machine Co., Rockford, Ill., which has been manufacturing friction clutches for the tractor industry for about four years, has recently produced clutches for automobiles, and we understand that the first production application will be on the 1940 Willys. The clutch is known as the Atwood-Thelander and is made in two types, the spring-loaded or regular automotive, and the toggle or constant-pressure type.

One of the elements of the clutch is a spider made of steel pressings, with either three or four arms. These

## Spring-Loaded,

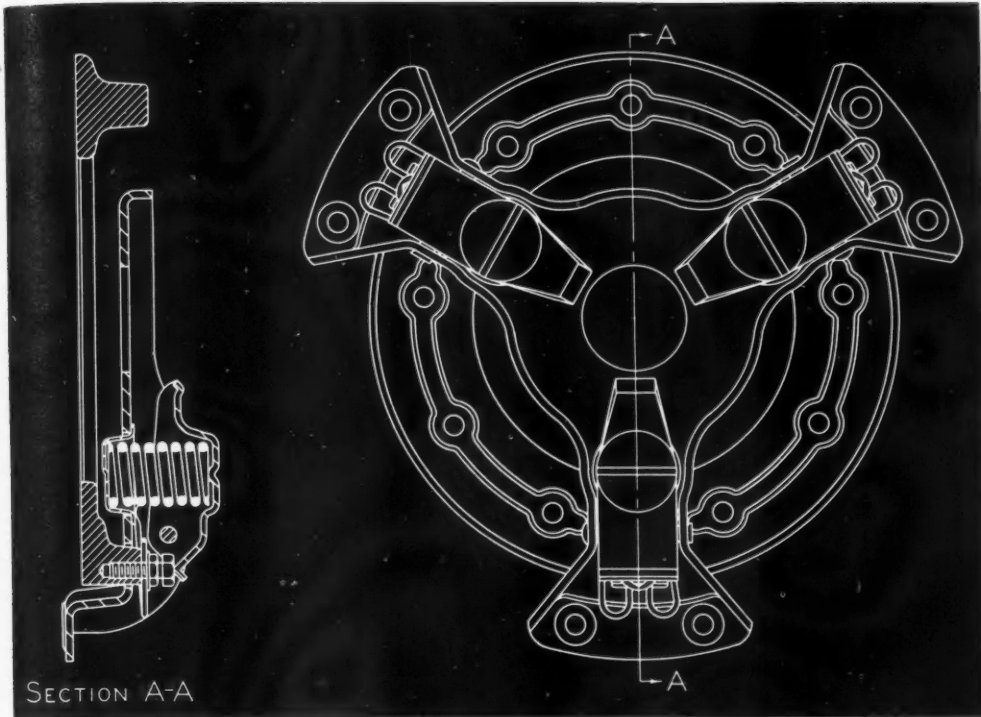
pressings have a channel section and are, therefore, unusually stiff for their weight. To each of the spider arms a double-armed lever is pivoted, and a coil spring, resting in a spring cup set into the spider arm, presses against a circular seat formed on the lever. The outer end of the lever bears against the head of an adjusting screw screwed into the pressure plate, while the inner end is provided with a protruding contact with which the throw-out collar engages.

As may be seen from the sectional assembly view of the three-armed type, the pressure plate is carefully ribbed to reduce to a minimum deflection and warping due to heating. The ribbing also increases the cooling area. It is claimed that since the pressure plate is not mechanically connected to the engaging mechanism, it "floats" into engagement with the driven member, which improves the engaging characteristics. In most clutches of the automotive type the engaging springs are in direct contact with the pressure plate, which is likely to reach quite high temperatures in operation. In the Thelander clutch the springs do not contact the pressure plate and there is, therefore, no danger of their temper being drawn. Cooling of the pressure plate, moreover, is facilitated by the fan action of the spider arms.

A feature of this design is that only a small number



Section and end view of Atwood-Thelander automobile clutch



damper springs.

The Atwood constant-pressure clutch, shown by one of the accompanying illustrations, is of the lock-up or toggle type used in heavy-duty tractors, combines, and Diesel-engine installations. It has a resilient member incorporated in it, which is said to be new in this type of clutch, and the feature is covered by a U. S. patent. This resilient member in the clutch mechanism permits of a constant pressure on the pressure plate. Further advantages claimed for this clutch are that it permits smooth engagement, that it compensates for wear, and that adjustment is required only at long intervals. This clutch also has good ventilation.

The Atwood Vacuum Machine Company has been manufacturing automobile body fittings for the past twenty years. It developed the ball-and-socket door hinge, the fully-automatic rear-deck prop, and a new easy-slam door lock. The clutch business was started independently. Four years ago it was taken over by the Atwood organization, and since that time clutches have been produced on a quantity basis. Three years ago the Atwood company purchased a plant in Auburn, Ind. This was fitted up with modern equipment and is now the clutch division of the company.

## Constant Pressure Clutches

of engaging springs are needed—equal to the number of arms in the spider. Friction in the engaging mechanism is said to be a minimum, because the only pivotal connection is at the fulcrum of the clutch levers.

Clutches for passenger cars are made with three-armed spiders and three springs, while those for trucks and heavy-duty tractors have four-armed spiders.

The clutch plate also is of novel design. It is made up of a number of segmental stampings which are riveted together and to the hub. These stampings are formed with pockets which house the clutch-plate

## A New Method of Road Lighting

A new method of road lighting has been under test in England for some time. In that country road surfaces often gleam when wet from rain, and it occurred to some of the lighting experts that under such conditions obstacles and persons in the road would be outlined better if the rays were directed against oncoming traffic. The vehicles then move toward the light and obstacles show the driver only their non-illuminated side, so that the silhouette effect is stronger.

The system is under test on a section of the Great Chertsey Road at Twickenham in the vicinity of London. This is a wide avenue divided by a central grassy

walk with a central line of trees that are still quite small. On one side of the road lamps were installed along the edge of the central walk and the sidewalk, and aimed in the direction of oncoming traffic. This method of illumination gave the most satisfactory results from the safety standpoint. Comparisons could easily be made with the opposite side of the road, where the lamps were arranged in the usual way, throwing equal amounts of light in both directions. With the new arrangement it has been possible to replace the 400-watt lamps previously used by 250-watt lamps, thereby reducing the cost of illumination by almost one-half, while the actual visibility is increased.

# Road Testing with

**T**HERE are on the market at present several instruments known as "grade meters," performance testers, or accelerometers,<sup>1</sup> which are designed for use in automobiles. Some of them consist of pendulums free to swing toward the front or rear of the car, some of curved glass tubes containing a liquid and a bubble of air which floats to the highest part of the tube, while another contains a quantity of mercury which is free to roll forward and backward. All these instruments, however, measure the same quantity, the "longitudinal component" of the angle between the apparent direction of the force of gravity and the vertical axis of the car. This angle is determined by the grade on which the car is traveling and the acceleration (or deceleration) of the car, which, in turn, is determined for a given grade, by the drag due to braking or other friction, and the driving effort of the engine.

When calibrated and used as an accelerometer, such an instrument is open to the objection that the acceleration indicated will be in error unless the car is on a level road. When calibrated and used as a grade meter, acceleration of the car will introduce an error. If, however, the reading of the instrument is interpreted as a measure of the ability of the engine to accelerate the car, the ability of the brakes to decelerate the car, or of the decelerating effect of mechanical friction and air resistance, no error will be introduced by either grade or acceleration.

Because of this fact it is possible to make, in a chassis on the road, engine output tests such as are usually made on a test block, and to measure the effect on power of changes in operating variables. It is also possible to measure the air and rolling resistance of a car at any speed the car can reach.

In order to interpret the readings of a gravity accelerometer, assume a vehicle weighing  $W$  pounds accelerating at the rate of  $a$  miles per hour per second, up a hill having a slope of  $s$  per cent. Suppose there is in the vehicle a pendulum bob free to swing forward and backward and provided with a scale calibrated in radians (or hundredths of a radian), zero being at the point where the bob rests when the vehicle is stationary or running at constant speed on the level.

Considering the forces acting on the pendulum at the bob, we find them to be, (1) the force of gravity, acting downward, and (2) the reverse force due to

By DALE KELLY

the resistance of the bob to the acceleration of the vehicle; this force acts in a direction opposite to that of the acceleration. Inspection of the diagram, Fig. 1, will show that the resultant of these two forces makes an angle with the vertical axis of the vehicle equal to  $(a/g) + (s/100)$  radians, where  $g$  is the acceleration of gravity, 22.0 miles per hour per second (32.2 feet per second per second).

The forces acting on the pendulum at its pivot are proportional in magnitude to, and in the same direction as, the forces other than gravity acting on the vehicle as a whole. These forces include air resistance and the reactions at the points of road contact to the drag or driving effect of the various wheels. They may be resolved into one component perpendicular to the road surface and very nearly equal to the weight  $W$  of the vehicle, and two components in the line of travel, of which one,  $F_o$ , is the apparent drag due to air resistance, tire and wheel bearing friction, and friction in the differential, drive shaft, and transmission gears, and the other,  $F$ , is the apparent driving effect at the rear wheels due to the engine. Inspection of the diagram will show that the resultant of these forces makes an angle with the vertical axis of the vehicle equal to  $\frac{F - F_o}{W}$  radians.

The pendulum, acted on by these two sets of forces, will assume a position such that

$$\frac{F - F_o}{W} = \alpha = \frac{a}{g} + \frac{s}{100}$$

where  $a$  is the reading of the pendulum scale.

In order to give equation (1) a more concrete meaning, a few figures may well be given. For most pneumatic-tired vehicles on good roads,  $F_o/W$  is equal to between  $1\frac{1}{2}$  and 2 per cent (30 to 40 lb. per ton) at moderate speeds, but on account of the air resistance its value rises rapidly at high speeds.

For modern popular-priced (80-85 hp.) cars under full throttle at moderate speeds,  $a$  is equal to from 12 to 14 per cent.  $F/W$ , therefore, varies between 13.5 and 16 per cent.

It should be noted, that while  $F$  and  $F_o$  do not correspond exactly to any actual forces, their difference,  $F - F_o$ , is exactly equal to the total rear-wheel driving effort above that required to maintain a constant speed on level road. It is the force available for hill climbing and acceleration.

In all of the foregoing it has been assumed that  $s/100$ , and  $a/g$  are so small that their sines and tangents are substantially equal to the arcs and their

**T**HE gravity accelerometer could be a very valuable instrument in place of a dynamometer where the engine cannot be removed.

<sup>1</sup> The Tapley Performance Meter, Tapley & Co., Totton, Southampton, England.

The Allen Performance Indicator, Allen Electric and Equipment Co., Kalamazoo.

# the Gravity Accelerometer

cosines to unity. That this assumption is justified is shown by the fact that for  $\alpha = 0.15$ , a value exceeded by few passenger cars in their high gear,  $\sin \alpha = 0.149$ ,  $\tan \alpha = 0.151$ , and  $\cos \alpha = 0.99$ . The discrepancies are smaller than those involved in the readings of any of the accelerometers now available. If the assumption is not made we have instead of (1) the more exact but less usable relation

$$\frac{F - F_0}{W} = \cos \frac{s}{100} \tan \alpha$$

From equation (1) we may readily derive another equation giving engine output or vehicle resistance in terms of power rather than force at the rear wheels. From (1) we have

$$F - F_0 = W \alpha$$

If  $P$  is the engine output, in h.p.

$P_0$ , the power consumed in overcoming air resistance, tire and wheel bearing friction, and friction in the differential, drive shaft and transmission gears, and  $s$ , the vehicle speed in miles per hour,

then

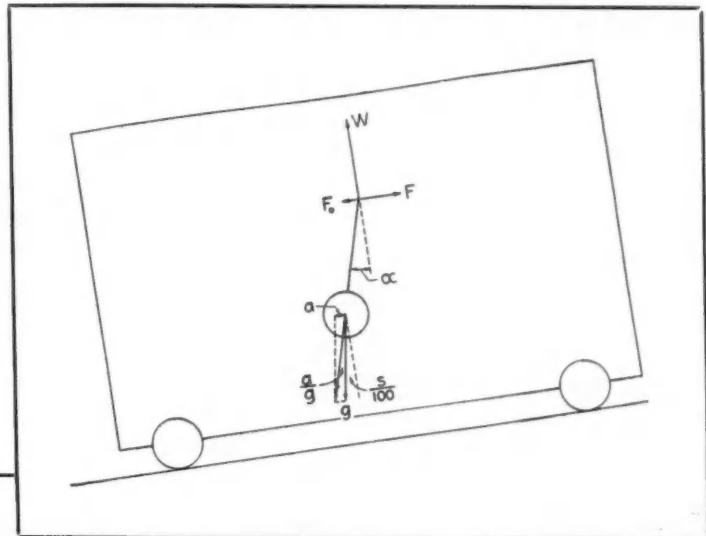
$$P - P_0 = \frac{W \alpha \times \left( s \times \frac{5280}{3600} \right)}{550} = 0.00265 W \alpha s$$

If we let  $\alpha_0$  represent the value of  $\alpha$  when  $P$  is 0 (measured by reading the accelerometer with the clutch disengaged), then

$$0 - P_0 = 0.00265 W \alpha_0 s \quad \text{and } P_0 = -0.00265 W \alpha_0 s \quad (2)$$

$$\begin{aligned} \text{But } P &= 0.00265 W \alpha s + P_0 \\ &= 0.00265 W \alpha s - 0.00265 W \alpha_0 s \\ \text{or } P &= 0.00265 W (\alpha - \alpha_0) s \quad (3) \end{aligned}$$

Most of the uses of the accelerometer are suggested by equations (2) and (3). In order to determine the power consumed in vehicle friction at any particular speed, we bring the vehicle to that speed, disengage the clutch, and read the accelerometer. The reading is  $\alpha_0$ . It is negative in sign. We substitute this reading in equation (2). Since bearing and rolling resistance are nearly independent of speed (power nearly proportional to speed) and air resistance is negligible at low speeds, a reading of  $\alpha_0$  at low speed is approximately equal to the mechanical resistance per unit of vehicle weight, at any speed, while the increase in  $\alpha$



**The forces acting on the pendulum at its pivot are proportional in magnitude to, and in the same direction as, the forces other than gravity acting on the vehicle as a whole.**

at any high speed is approximately equal to the air resistance per unit of vehicle weight.

To measure the maximum engine output at any engine speed, calculate from the gear

ratio and tire size the corresponding vehicle speed, measure  $\alpha_0$  at that vehicle speed and then engage the clutch and measure  $\alpha$  at full throttle. Calculate the power from equation (3).

To determine the friction and pumping losses in the engine, cut off the ignition and read  $\alpha$  with the clutch engaged. Calculate the power from (3), bearing in mind that  $\alpha$  is now negative in value.

Deceleration due to brakes may be measured in a similar manner. However, a decelerometer able to measure such large decelerations as are produced by brakes will not have a very open scale in the region of decelerations produced by normal vehicle resistance.

Theoretically the above measurements can be made either on level ground or on any slope. However, if engine-output runs are made on steep up-grades, the speed will change less rapidly, and more time will be afforded for careful readings. For the same reason, vehicle friction and engine friction tests are best made on down-grades.

As an example of the use of the gravity accelerometer, figures are given for two late-model cars, showing the performance obtainable without knocking at 30 m.p.h. on three different grades of gasoline:

(1) A third-grade gasoline of about 64 octane number.

(2) A "regular" gasoline of about 72 octane number.

(3) A "premium" gasoline of about 78 octane number. Each reading is at the optimum spark advance for the particular gasoline in use.



	1937 Chevrolet	1935 Plymouth
Third-grade gasoline	9.8 per cent	10.0 per cent
Regular gasoline	12.0 per cent	11.2 per cent
Premium gasoline	12.8 per cent	11.6 per cent

The differences between the two cars are not significant, since the fuels were not from the same batches and the amount of carbon in the combustion chambers was not known.

The values given are those of  $\alpha$  in equation (3). A value of 10 per cent indicates that the car can maintain a constant speed of 30 m.p.h. on a 10 per cent grade, or accelerate on level ground at 10 per cent of the acceleration of gravity, or accelerate up a grade of  $s$  per cent at the rate of  $(10-s)$  per cent of the ac-

celeration of gravity. The values given were obtained on a relatively gentle up-grade, the cars were accelerating, and since, owing to the presence of some unvaporized gasoline in the intake manifold, an engine often develops less torque while accelerating through a given speed than it does when held down to the same speed by its load, the values may not be as high as would be obtained on a steeper hill.

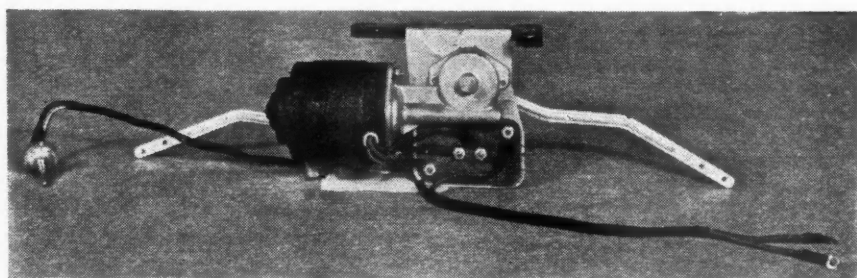
The above considerations show that the gravity accelerometer could be a very valuable instrument to an organization not possessing a chassis dynamometer and not desiring to go to the expense of removing an engine from a chassis for test. One example is in the case of repair shops engaged in adjusting automobile engines. In England such accelerometers are sometimes bought by the owners of passenger cars and permanently installed on the instrument panels.

## Stewart-Warner Has A New Electrical Windshield Wiper

**E**NGINEERS of the Stewart-Warner Corporation for some years past have been working on the development of an electric windshield wiper that would incorporate an independent motor sufficiently powerful to operate effectively under adverse-weather conditions, that would operate uniformly and constantly, and that would permit of automatic and permanent parking of the wiper blades when not in use, thereby preventing obstructions to the view. The wiper developed by them is standard equipment on Packard Series 110 and 120 cars for 1940.

The motor of this wiper is shunt wound, and its armature is statically and dynamically balanced. Self-aligning oil-less bearings are used throughout. Oil-less bushings are used also in the linkage at the drive crank of the mechanism. A separate fuse is provided for the motor circuit.

Current for operating the wiper is supplied by the battery. When the ignition current is turned off, the wiper motor comes to a stop automatically, although the driver may forget to turn off the wiper switch. An automatic switch brings the wiper blades into the parking position at the lower edge of the windshield im-



*Stewart-Warner electric windshield wiper. The crank to which the two long links are connected is driven from the motor through a worm and wheel*

mediately after the switch is turned off. It short-circuits the armature, thereby producing a dynamic braking effect.

The wiper-arm transmissions are provided with safety release clutches which serve two purposes. When the switch is turned on and the wiper blades cannot move, owing to ice formation, or an obstruction, the clutch will release the arms automatically, thereby preventing damage to the mechanism and allowing the motor to run. When the switch is off, the clutch, by releasing the wiper blades, permits them to be swung out of position for the purpose of wiping the windshield.

When installed, the unit is barely visible from either inside or outside the car. The motor is installed behind the dashboard and the two wiper blades and arms when not in use are parked horizontally at the base of the windshield. The complete unit is rubber-mounted and operates practically without vibration and noise.

# PRODUCTION LINES . . . .

## Long Stretch

One of the fine car builders, known for outstanding work in deep drawing of sheet metal, makes an amazing contribution to the art for 1940. In 1936, this producer reached a hitherto unmatched goal by fabricating an enormous front fender in one piece. Compared to the new product that achievement is almost kindergarten stuff. For the sheet metal to which we direct your attention is an entire front end drawn from a single blank. It incorporates in the one stamping—the front fender, an integrally-drawn headlamp housing, front shroud dropping below the bumper line, and the entire hood side. At the upper rim of the headlamp housing the measured elongation is almost 50 per cent. The blank is a rectangular piece of sheet steel 54 in. x 94 in. Thirty-ton dies are used in the detail drawing operations. Incidentally, the presses which require reaching into die area are protected by batteries of photocell units supplied by the Electronic Control Corp., to assure the operators' safety.

## Cuts Weight

Although many car builders added weight to the new models, one prominent producer has actually made considerable weight reduction, to the advantage of cost and performance. This was accomplished not by the crude procedure of deciding to take out so much weight, but by painstaking fine-tooth combing of every part of the car. With so many individual elements involved, a few ounces pared here and there, a few pounds taken out of larger parts, all add up to savings varying from 150 to 200 pounds in cars of different sizes.

## Electrical Changes

With little exception generator output will be boosted on 1940 cars, ranging around 33 amp., hot. Too, most makes will have automatic voltage-current regulation—a luxury feature on a high-priced car but a few years ago. We believe that battery sizes will remain without much change. And the recent trend to battery location under the hood bids fair to remain frozen where it was last year.

## Zinc Alloys

We can recall but a few years back when the suppliers of high-grade zinc alloys held their fingers crossed wondering about the future. By this time they know, as do we, that 1940 should achieve the highest tonnage of zinc alloy die castings in many a year. Major percentage of radiator grilles will be made in die castings, supplemented by dummy grilles at the front and in at least one case, at the side of the front

fender. Most stylists have trended to an increase in bright decoration at the front end and body exterior, dividing the business between stainless steel and die castings. Several large radio grilles will make their appearance, augmenting the volume of die castings for ornaments, for hardware, for exterior accessories. All in all, it's going to be a proud year for high-purity zinc.

## Engine Balance

No one who has followed engine development in recent years will deny that much has been done to create smoother running engines. Apart from niceties of design, this is best accomplished by precision balancing of components such as the rods, the crankshaft, pistons, and their sub-assemblies. A gigantic step ahead is promised by a prominent car producer whose entire line of engines for the coming season will feature the balancing of the complete engine, after it has been assembled, inspected, and power-tested. Surprisingly enough, the final balance will be held as closely as is the balance of a single part.

## More Plastics

Use of plastics in automobiles is growing at accelerated pace. To be sure the various types of modern plastics have found their way into ornamentation, on instrument panels, and in other accustomed places, only to increase the weight per car. But in addition, plastics have displaced glass for tail lamps, for signal lamps, etc. We do not foresee any sensible adoption of plastics in structural details, although one manufacturer has been reported as toying with the use of a new structural type of material for large surface areas.

## Shifting

Following the increasing adoption of remote control mechanism, a prominent parts maker is reported to be introducing a vacuum servo device for gear shifting. It's intended primarily for motor trucks and buses and is particularly useful for COE, rear engine drive, and other arrangements of major units where a servo mechanism aids in relieving the operator's task.

## Direction Signal

Direction signal has been one of the most talked-of items in recent years. Buick offered the first standard equipment signal last year. This year the idea is full-blown. It will be found as standard equipment on a few makes, optional on many others. It's a great safety feature.—J. G.

# MEN and MACHINES . . .

## *Machining of cast two operations on*

**T**HE details of an extremely interesting set-up for machining aluminum pistons at Plant No. 4 of the General Motors Truck & Coach Co., Pontiac, Mich., have been brought to the attention of this column by the Gisholt Machine Co., Madison, Wis. Machining of the cast aluminum pistons (Hardness: Brinell, 90-120) is completed in two operations on two Gisholt No. 12 automatic production lathes. Tungsten carbide tools are used, and the cutting speed is 1000 f.p.m.

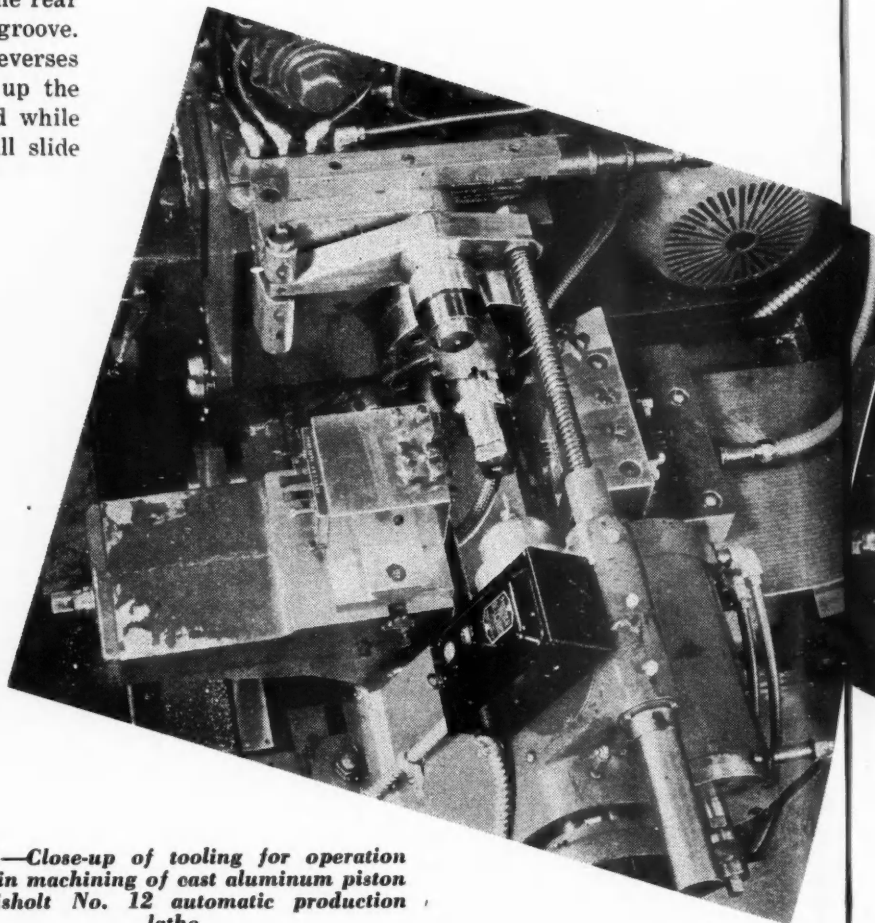
For the first operation the piston is held on a hydraulically operated, expanding, centering and driving fixture having independent action of each opposite pair of jaws so that the piston is chucked concentric with its inside walls and with minimum distortion. Fig. 1 is a close-up view of the tooling arrangement. The sequence of operations is, as follows: Front slide tools turn O.D., then hold up. Simultaneously the rear slide tools rough face the skirt end and rough groove. At the end of the grooving cut the rear slide reverses feeds, retracting grooving tools and cleaning up the skirt face. At the end of the turning cut, and while the rear slide is feeding back, the speeder drill slide drills and centers the head end while the skirt boring slide bores and chamfers.

Depth of cut ranges from 1/32 in. to 1/16 in., and floor to floor time on this operation is 15 sec. The Gisholt company points out that the simplicity of set-up of the machine makes it possible to change completely from one size piston to another in less than 15 min.

Fig. 2 shows the tooling for the second operation. Here the piston is held on an arbor which fits into the skirt bore and on the tailstock center. It is located against the face of the skirt and is driven across balancing lugs in the skirt end by means of a floating driver. The sequence of operations is, as follows: The front slide tools turn the O.D., finish turning diameters B, C, and D (see accompanying drawing—Fig. 3) and turning diameter A preparatory for grinding. Rear slide tools finish size the grooves, break corners of grooves and finish shave the land D which is smaller than the other diameters. Depth of cut ranges from

0.010 in. to 0.020 in. on this operation. Floor to floor time is 12 sec.

The lathe on which these operations are performed is one of the most recent additions to the Gisholt line. It is adaptable to a wide range of work in both high production manufacturing and comparatively small lots. Specifications include: Maximum swing, 16¾ in.; swing over front carriage, nominal, 10 in.; swing over front carriage, maximum, 12 in.; and maximum length between centers, 18 in. Range of spindle speeds is as follows: 1150 r.p.m. motor, low spindle gear, 41 to 245 r.p.m.; 1150 r.p.m. motor, high spindle gear, 111 to 667 r.p.m.; 1750 r.p.m. motor, low spindle gear, 62 to 370 r.p.m.; and 1750 r.p.m. motor, high spindle gear, 167 to 1000 r.p.m. Longitudinal travel of the



**Fig. 1—Close-up of tooling for operation No. 1 in machining of cast aluminum piston on Gisholt No. 12 automatic production lathe**



## aluminum pistons completed in two automatic production lathes

front carriage (standard) is 7 in. The travel of the rear slide (standard) also is 7 in. The feed range is from 0.000 in. to 0.048 in. per spindle revolution.

Another interesting lathe has been developed by the Bradford Machine Tool Co., Cincinnati. The head of this machine is of heavy box-type construction with a center bracing wall to assure rigidity under the heaviest cut. A high carbon steel spindle is mounted on pre-loaded heavy-duty taper roller bearings. Twelve selective speeds are available in geometric ratio through especially heat-treated, nickel-alloy steel gears sliding on splined shafts and are easily operated by three conveniently located levers. Precision taper roller bearings are used throughout for all rotating shafts.

The drive from the constant-speed motor to the selective gear shaft is through multiple V-belts and a multi-disc clutch operated from a handle conveniently located at the front of the head. A multi-disc brake is operated through this same handle for stopping the spindle instantly, thus jogging is effected with the

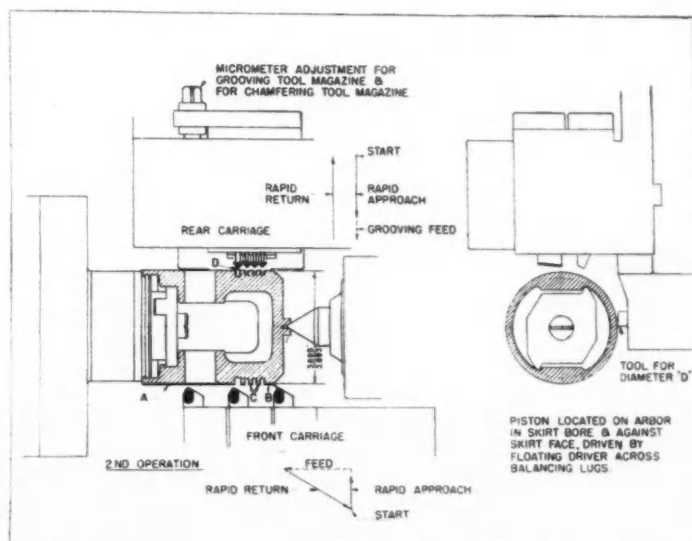


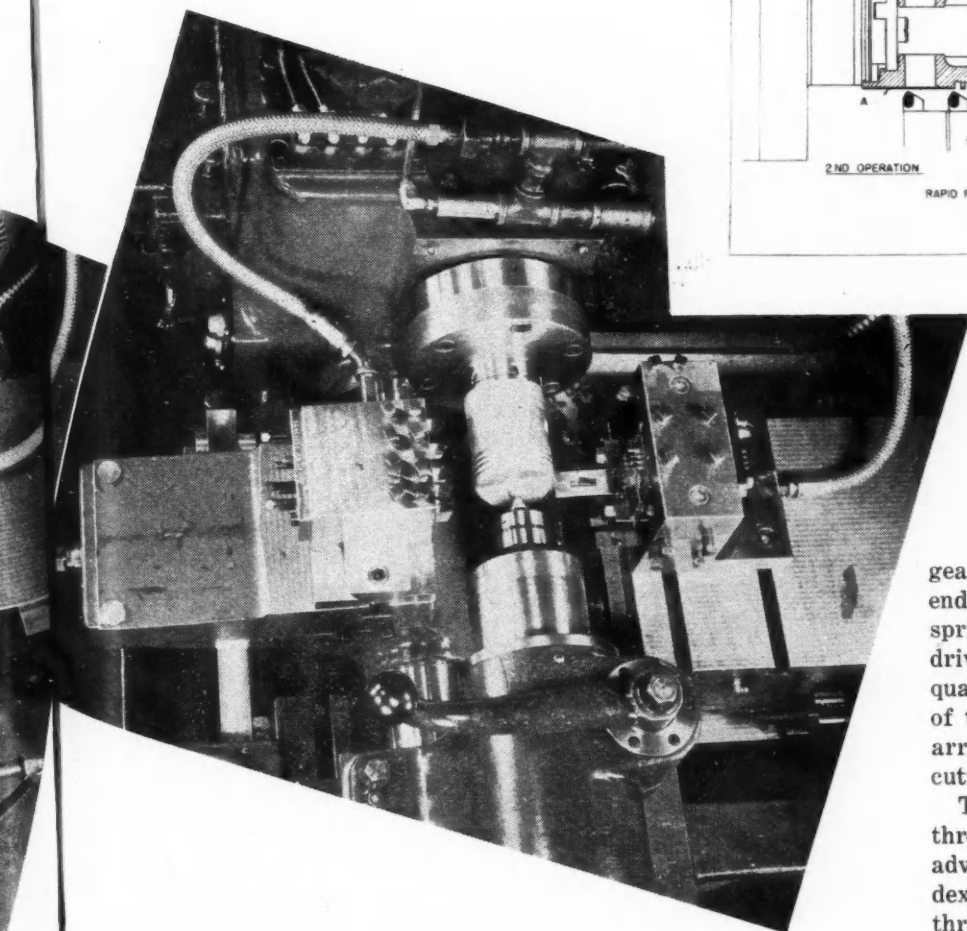
Fig. 3—Layout of operation No. 2 for machining pistons on Gisholt lathe

Fig. 2—Tooling for operation No. 2 in machining of piston

motor running at all times.

Lead screw and feed rod are driven from the spindle through feed reverse gears operated inside the head at the drive end and locked in the selected position to a spring plunger in the shift handle. The drive to the quick-change box is through a quadrant gear easily accessible on the end of the head. The quick-change gear box is arranged for selective feeds and thread cutting.

The quick-change gear device for the threads and feeds harmonizes the drive for advancing the tool carriage. A thread "index" gives a complete range of standard threads, all instantly available. Ordinary



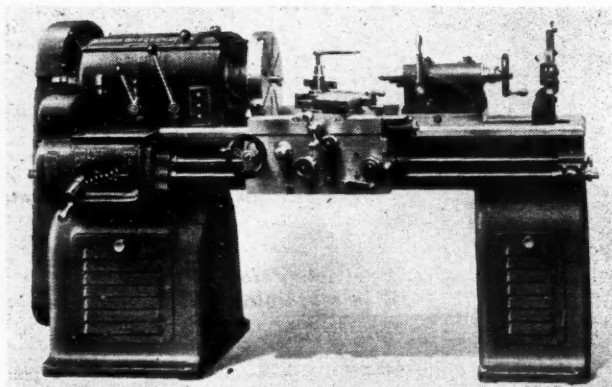
change gears also can be used between the lead screw and the spindle for cutting special threads. Rotation of the lead screw is required only for screw cutting.

Reverse for the feeds is effected by a latched lever at the apron acting through a sliding housing carrying two bevel pinions which engage opposite sides of a large bevel gear in the lathe apron. "Forward," "reverse," and "disengaged" positions for the lever and the feed are provided. The feed rod and lead screw are driven from the main spindle by means of a train of gears, which comprise the "tumbler" gears in the head. A lock in the lathe apron prevents the simultaneous engagement of the thread and feed cutting gear trains.

The R. G. Haskins Co., Chicago, has announced an addition to its line of Type C air controlled tapping machines. The new machine is known as the No. 2-C and has a capacity of from No. 8 to 5/16-in. steel and 3/8-in. brass.

Compressed air controlled by an automatic air valve furnishes the pressure required for both the tapping and reversing strokes of the tap head. The automatic valve also controls the speed with which the tap is fed into and reversed out of the part. A pedal unit enables the operator to start or stop the tapping cycles, which are under control of the automatic valve. The machine will operate in continuous cycles as long as the air valve is held open. It also can be used intermittently by operating the pedal and then releasing it to produce one complete cycle. This machine lends itself to feeding parts into a simple holding fixture or a magazine fixture. It also is adapted to hopper feed, dial feed, or other especially designed fixtures.

Announcement has been made by the Jones & Lamson Machine Co., Springfield, Vt., that new chaser holders are now available for its model No. 22 tangent

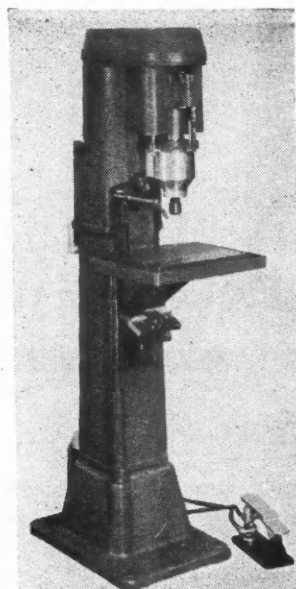


*Bradford lathe equipped with 12 selective speeds in geometric ratio*

die head. These chaser holders will increase the capacity of the die and are said to make it very versatile when used on hand screw machines and turret lathes where the job changes are frequent and a die with a large threading range is required.

The model 22 tangent die can now be furnished with chaser holders of 1/4-in. to 3/4-in. capacity (these holders take the standard model 21 die chasers) and with chaser holders of 3/4-in. to 1 1/4-in. capacity. Each set of holders will accommodate any diameter and

*Air controlled tapping machine of the R. G. Haskins Co., Chicago.*



pitch thread within the capacity of the die. Chaser holders with a capacity of 1 1/8 in. to 1 1/2 in. also are available for use with this same die.

Additional new items of equipment of interest to readers of *Men and Machines* are as follows:

A Brinell machine, product of the Detroit Testing Machine Co., Detroit, which is especially useful for Brinell testing of rather large castings and forgings. Two

standard sizes are available. No. 1 has a throat depth of 6 in., a maximum height of 12 in., and a table measuring 12 in. by 20 in. The No. 2 size has a throat depth of 9 in., maximum height of 18 in., and a table 17 in. by 24 in. . . . An infinitely variable speed drive unit with capacities up to 80,000 lb. torque and infinitely variable speed ranges of from 310 r.p.m. forward to 9 r.p.m. reverse. This unit, built by Mechanical Handling Systems, Inc., Detroit, is available either for right or left hand installation and with either vertical or horizontal output shafts. . . . Double action press for the volumetric cutting of uncured rubber washers for use in the manufacture of rubber valve has been redesigned by the Ferracute Machine Co., Bridgeton, N. J. The press was redesigned to reverse the motions of the ram and plunger so as to have the ram operated by crank motion and the plunger by cam motion. The latest features are built into this press, such as individual motor drive, enclosed guards, inclining mechanism and bronze bushings throughout. . . . A new positive acting, automatic centrifugal clutch for all types of industrial power drives developed by Dawes Equipment, Inc., Detroit. . . . The DeVilbiss Co.'s new light-duty, rotary, spray-finishing machine with a production range of 400 to 3000 articles per hr. Turntable of the machine is 34 1/2 in. in diameter and carries 15 spindles, each of which rotates on ball bearings. . . . A set of optical parallels for checking the flatness and parallelism of faces of micrometers, measuring machines and instruments by the light wave interference method announced by the Van Keuren Co., Watertown, Mass. . . . The "Vortexeddy" spray tank especially designed by Storts Welding Co., Meriden, Conn., for racked parts rinsing in electroplating departments. The rinsing operation is performed by alternate vortexes of spray streams circulating clockwise and anti-clockwise, and interrupted by other straight line spray streams which produce a multiplicity of eddies moving in as many directions. Provision is made for turning the work so that every portion of the surface is

*(Turn to page 287, please)*

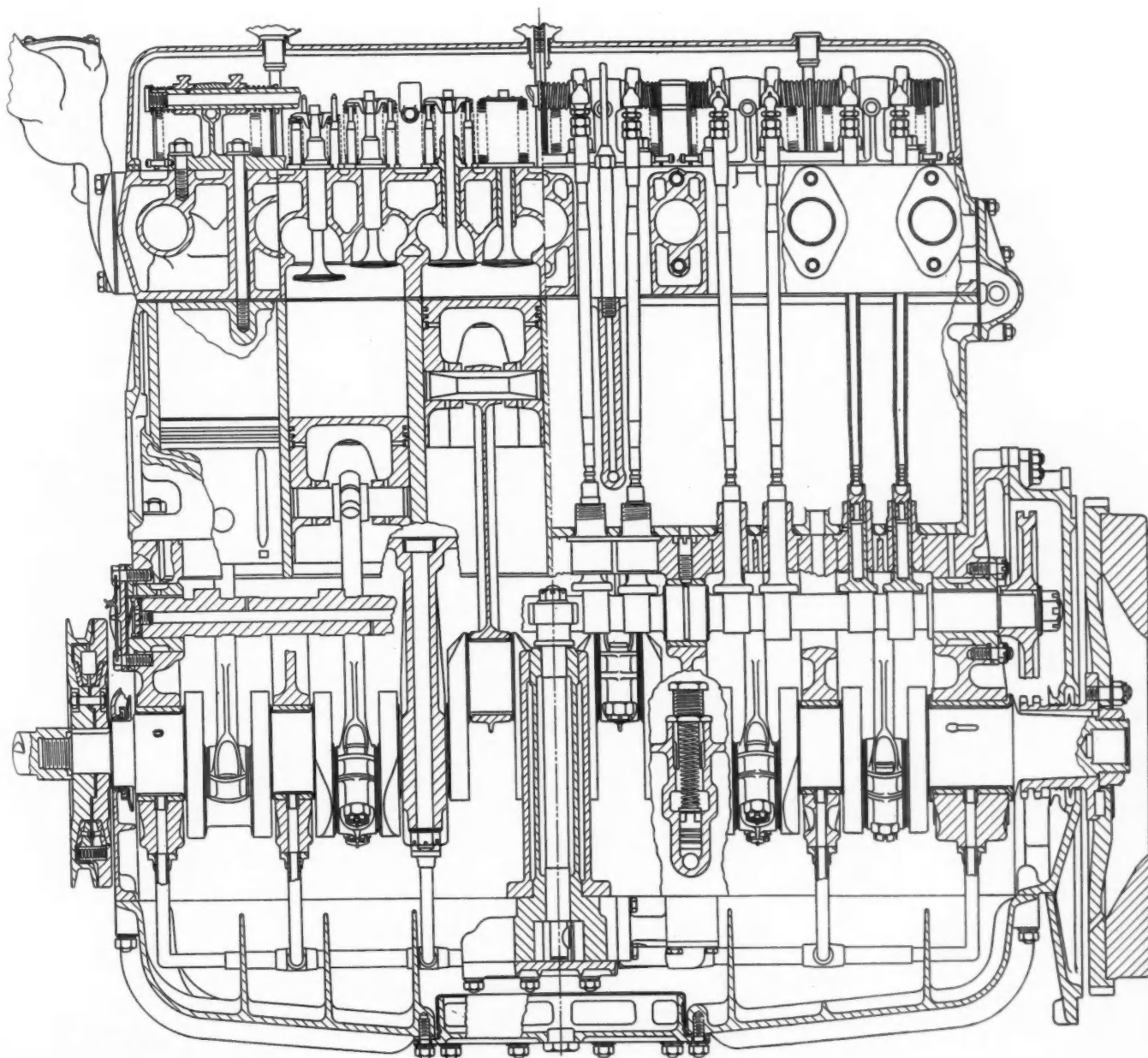
# ALVIS SIX CYLINDER ENGINE

## *Longitudinal Section*

**T**HE Alvis 268-cu. in. engine, which is used in high-grade passenger cars capable of 100 m.p.h., has a bore and stroke of 3.62 by 4.33 in. With a compression ratio of 6.62 it develops 126 h.p. at 3,600 r.p.m. The maximum torque is 238 lb.-ft. at 2,000 r.p.m. Valves have pushrod operation and are located at the center of a pent-roof type of combustion chamber. Each valve is controlled by an encircling cluster of nine small springs, a practice followed by Alvis for many years. The camshaft, with four phosphor-bronze

bearings, is driven by a duplex roller chain from the rear end of the crankshaft, which serves also for driving the generator, ignition unit, and water pump.

The crankcase and detachable cylinder head are of cast iron. There is no communication between the water spaces of the cylinder and head through the cylinder-head gasket, but instead there is an outside transfer passage at the rear of the block. Aluminum is used for the crankcase, the front end of which has integral bearer arms with a conical housing top and



ENGINE DESIGN



# ALVIS SIX CYLINDER ENGINE

## *Transverse Section*

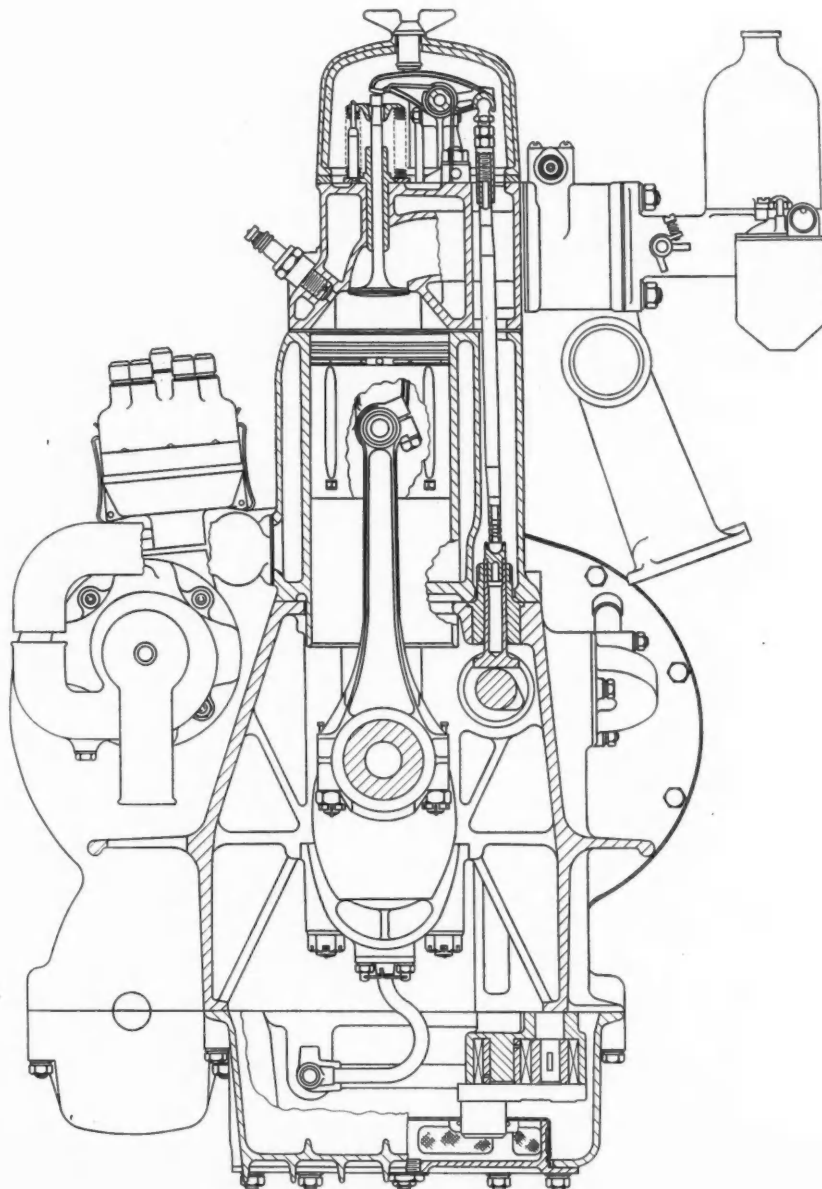
bottom for rubber mounting collars. A third point of support is a rear extension of the clutch casing, the transmission being a separate unit.

The seven-bearing crankshaft has  $2\frac{3}{8}$ -in. journals and  $2\frac{1}{8}$ -in. pins; steel backed white-metal journal bearings are used. All bearing caps are held by bolts extending from the cylinder base, where the heads are recessed. Connecting rods are I-section steel with direct-contact white-metal big-end bearings; wrist pins are located by clamping bolts in the small-ends. Pistons are of aluminum alloy.

Lubrication is forced throughout, except to the wrist pins. The oil pump is of the gear type with intake filter, flange-fixed to the bottom of the sump.

Three S.U. horizontal carburetors are mounted directly on separate intake port branches, with a thermostatic device for easy-starting and a balance pipe.

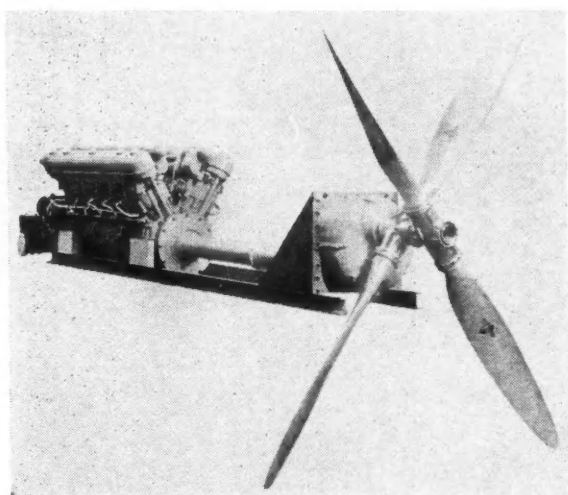
A Blundell dual air silencer is secured to an aluminum manifold connecting the three carburetor units. Auxiliaries include a revolution counter with gear drive from the camshaft.



# Double Propeller Drive

*with propeller a distance  
from the engine on remote drive*

**T**HE French National Engine Manufacturing Company is now manufacturing aircraft powerplants with two adjacently located propellers turning in opposite directions, at a distance from the engine, as shown by the accompanying illustration. Placing the propellers at a distance from the engine permits of locating the latter in the center of gravity of the plane.



*S.N.C.M. Sterna engine with shaft and gear drive to double propellers rotating in opposite directions*

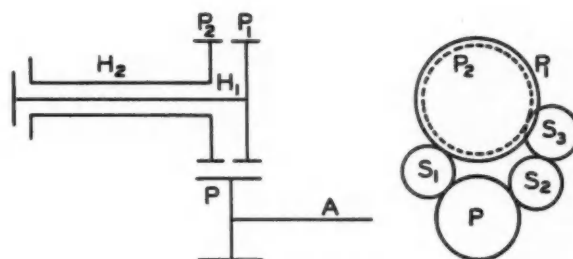
This permits of better streamlining of the fuselage, as the engine is located where the fuselage has its largest cross section. Thus there are no restrictions on the design of the nose of the fuselage, which can be made of the aerodynamically-optimum form. The use of two propellers rotating in opposite directions completely eliminates any torque reaction on the fuselage, and the smaller diameter of the propellers permits of the use of a lower (and lighter) landing gear.

The remote drive comprises a shaft carrying a spur pinion at each end, these pinions having splined joints with the shaft. One of the spur pinions engages with an internal gear of the same number of teeth, mounted on the engine crankshaft; the other engages similarly with an internal gear secured to the primary shaft of the reduction gear. A torsional vibration damper is

provided, consisting of a tube that is rigidly secured to the shaft at its forward end and connected to it at its rear end through the intermediary of friction disks. The shaft has spherical supports at both ends. Its gear drive permits of a torsional deflection of 1 deg. 20 min. The drive shaft is inclosed in a tubular housing with spherical supports on the engine housing and the reduction-gear housing, respectively. The shaft drive weighs 60 lb.

The transmission gear shaft referred to in the foregoing drives a primary shaft fitted with a 21-tooth, wide-faced pinion. This primary shaft drives two concentric secondary shafts, each provided with an 18-tooth pinion, one of these being driven through an intermediary pinion which rotates in the same direction as the crankshaft, the other through two intermediary pinions, which rotate it in the opposite direction to the crankshaft.

Therefore, the two secondary shafts turn in opposite directions. Each of them is fitted with a propeller hub. The thrust of the propellers is taken on thrust bearings and the propellers are held concentric by the thrust bearings and roller bearings. Lubrication of the reduction gear is effected by means of a separate oil pump, and an accompanying oil cooler, in the form of a circular ring, is supported by the housing of the reduction gear. The reduction gear proper weighs 195 lb., the two propeller hubs, 186 lb., and the whole assembly (shaft drive and reduction gear), 465 lb. (for an engine developing 1200 hp. at take-off and 900 hp. at 2700 r.p.m. at 13,000 ft. altitude.).



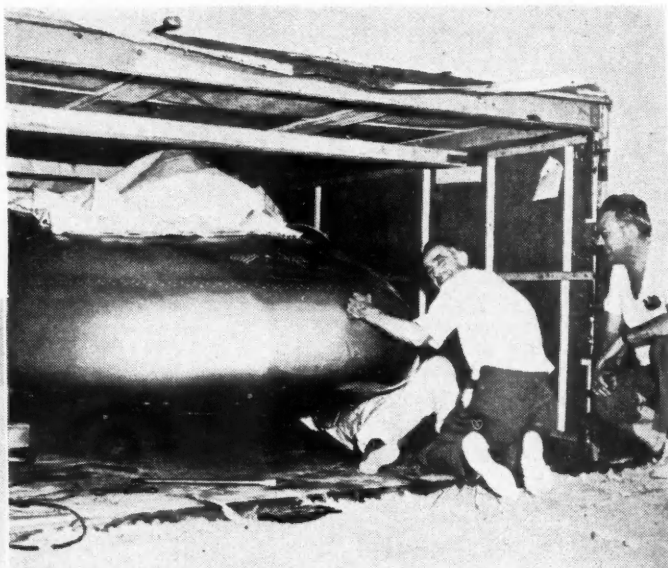
*Diagram of shaft and gear drive*

A, crankshaft; P, pinion secured to crankshaft; P<sub>1</sub>, gear secured to first propeller; P<sub>2</sub>, gear secured to second propeller; H<sub>1</sub>, drive shaft of first propeller; H<sub>2</sub>, drive shaft of second propeller; S<sub>1</sub>, S<sub>2</sub>, and S<sub>3</sub>, intermediary gears.

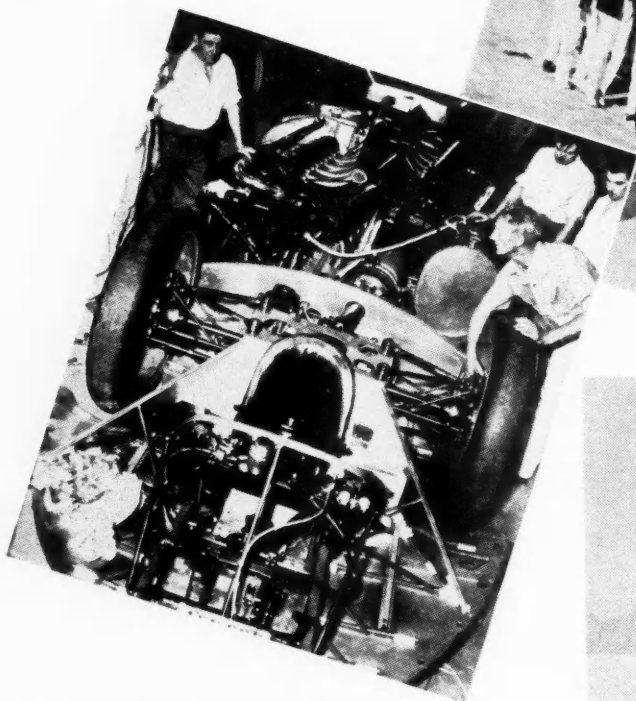
# Cobb Makes New Record



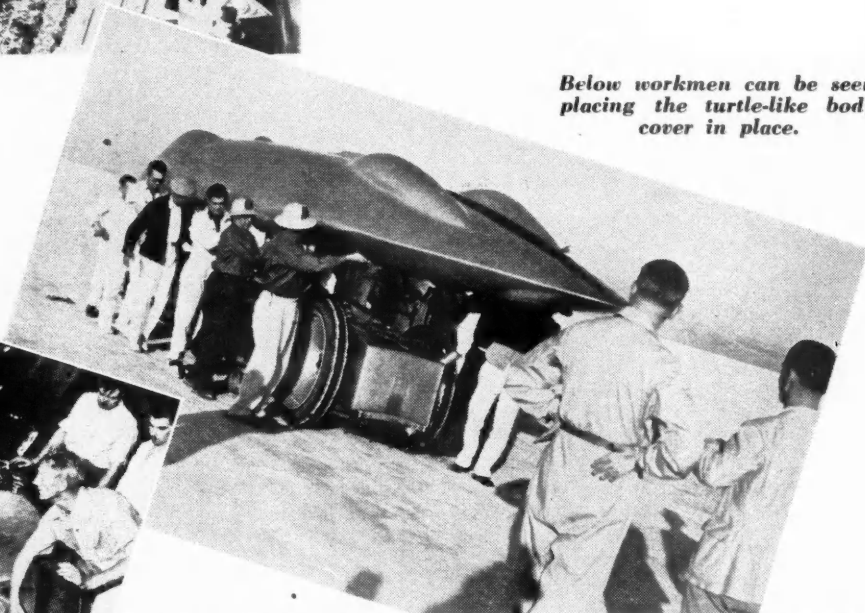
Stringing the wire for the electric eye measuring devices that were to measure the 369.53 miles per hour World record of John Cobb of England. Below mechanics are making final adjustments before the trials.



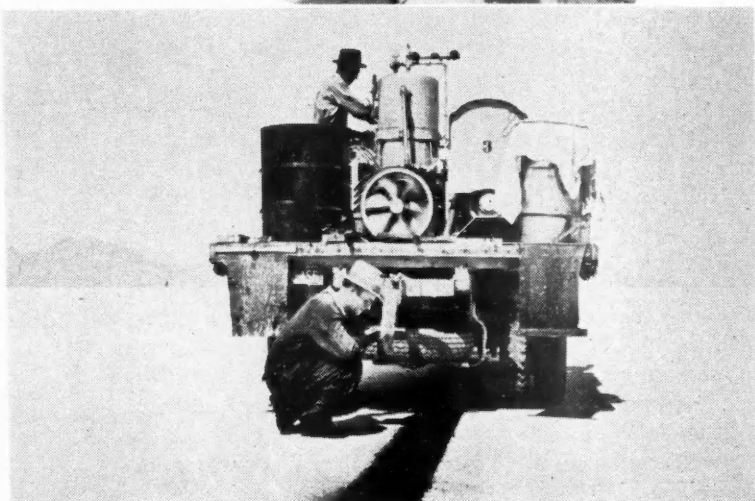
Above P. T. Taylor, builder of the car, and E. J. Sanders, engineer of the Gilmore Oil Co., are unpacking the huge aluminum body of the car on its arrival at the Bonneville Salt Flats in Utah.



At the right is a specially equipped truck that is laying down a three-foot wide marker line for Cobb to follow in his dash.



Below workmen can be seen placing the turtle-like body cover in place.





## NEWS OF THE INDUSTRY

### Installment Sales Decreased in 1938

#### Slump Exceeded Drop In Cash-Credit Sales

Installment sales by automobile dealers in 1938 were 33 per cent below 1937. This sharp decrease in automobile dealers' time-payment sales last year greatly exceeded the percentage decline of either their cash or open-credit sales, according to Commerce Departments' Marketing Research Division.

Designed as a guide for retailers in determining their credit policies, the Bureau's annual retail credit survey analyzes the sales, collections and bad-debt loss experience of identical firms in 1937 and 1938. The new edition of the survey also features a special study of installment terms which, the Department said, has greatly increased its value to retailers.

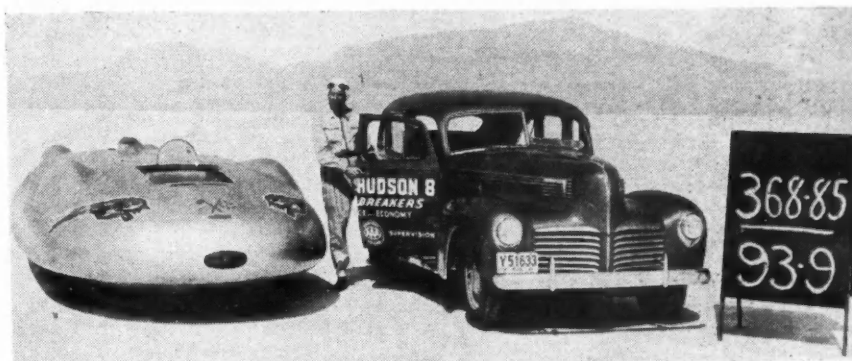
The survey shows a decrease in the total sales of 127 reporting automobile dealers in 1938 of 27.8 per cent, compared with the Bureau's estimated decline of only 11.3 per cent below 1937 for all retail sales in the United States. The most important factor in the extreme reduction of total 1938 sales volume of automobile dealers was the drop of 33 per cent in their sales on installment plans. These deferred-payment transactions, which cover the majority of new and user car sales, represented about 43.4 per cent of the total volume of the average dealer in 1937.

(Turn to page 292, please)

### Patent on Auto-Poise Granted to Hudson

The Hudson Motor Car Co. announced that the U. S. Government Patent Office at Washington has granted a patent covering the new principle of car control, developed by Hudson engineers, known as Auto-Poise Control. The patent is a basic one, the company said, applying to any type of stabilizing attachment directly connected to the wheels. Notice of the patent issue appears in the Patent Office Gazette of Aug. 15.

Described in the patent papers as a stabilizer mechanism, this patented Hudson development employs a positive, active mechanical force that helps to hold wheels to their course.



#### —And Another Record

John R. Cobb, English speed king, shortly after setting the new world's mile speed mark at 368.85 m.p.h., took another record in the stock car field. Driving this 1940 Hudson Eight sedan over the same course his international racer took, he broke the class C record for closed cars by averaging 93.9 m.p.h. in two directions over the mile course.

## Reciprocal Trade Agreement Proposed with Argentina

#### Approval of Commerce Arrangement May Improve Automotive-Machinery Exports

A proposed reciprocal trade agreement with Argentina which, if approved, will be the first comprehensive commercial arrangement between the two countries since 1855, is the subject of public hearings called for Oct. 16.

Although United States exports to Argentina since 1924 have exceeded imports from that country by \$486,900,000, the State Department feels the agreement will enable this country to maintain its competitive position in a market of great importance, and reports that United States trade with Argentina has suffered in recent years for lack of a trade agreement.

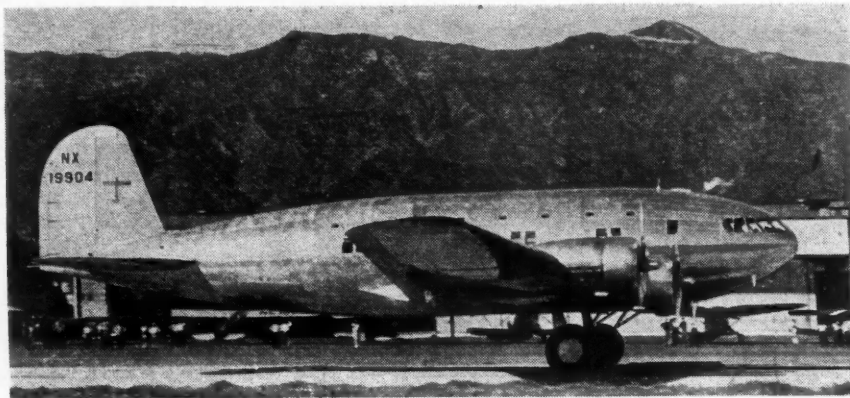
Among the American products sold to Argentina in 1938, machinery and vehicles comprised a large proportion of the total, according to Commerce Department figures. Exports in this category, valued at \$59,121,000 are slightly below their value for 1937, represent approximately two-thirds of this country's exports to Argentina. Exports of aircraft were up 46 per cent and those of agricultural machinery and tractors were 24 per cent larger than in 1937, while sales of automobiles

and parts declined only moderately from \$25,420,000 in 1937 to \$24,138,000 in 1938.

Among the principle metal items outside the machinery field exported to Argentina in 1938, 21,847 tons of wire and manufactures, and 6221 tons of tubular products and fittings. This compared with 1937 export figures of 10,643 tons of sheets, 47,174 tons of tinplate, 16,231 tons of wire and manufactures, and 9578 tons of tubular products and fittings.

Out of \$59,121,000 worth of machinery and vehicles sold to Argentina in 1938, automobiles, parts and accessories represented a value of \$24,138,000; agricultural machinery and implements, \$14,234,000; and aircraft and parts, \$6,187,000. Exports of passenger automobiles increased from \$5,679,000 in 1936 to \$10,383,000 in 1937 and dropped slightly to \$10,109,000 in 1938.

Tariff concessions on Argentina imports are being considered for certain types of foodstuffs, including canned meats, fresh fruits and vegetables, tanning extracts, vegetable oils, raw wool, hides and furs.



Acme photo

### Stratoliner Groomed for Record Dash

With customary secrecy, Howard Hughes, millionaire oil man and speed flier, is reported to be grooming his new \$250,000 Boeing Stratoliner for another record-breaking transcontinental flight from Glendale, Cal. The new craft is pictured just before a trial flight at Glendale.

## Rise in Steel Demand Expected As a Result of European War

### Consumers May Anticipate Requirements To Avoid Possibility of Future Shortage

The effect of the outbreak of war in Europe on steel market conditions has been hardly noticeable so far while the impact on non-ferrous metal prices was immediate and the cause of much uneasiness among consumers. Specifications from automobile manufacturers as well as parts makers for sheets, strip steel, hot rolled and cold finished carbon and alloy steel bars have been on the uptrend and it is extremely doubtful that consideration other than scheduled assemblies entered into any of these releases. Steel producers expect before long quickened demand as the result of the war in Europe and a good many consumers are likely to anticipate their requirements more liberally to guard against the possibility of their not being able to get steel when they need it. For the present, however, attention is focused on the effect of European hostilities on American business in general and on employment, factors which will directly affect the extent of 1940 model car sales and, therefore, the tonnage of steel consumed by automobile manufacturers in the next few months. The American Iron & Steel Institute estimated that 58.6 per cent of the country's ingot capacity would be in operation, the Labor Day holiday having cut output by about 10 per cent. Operations during the preceding week stood at 63.6 per cent.

On the eve of the outbreak of European fighting, Straits tin was quoted at around 49 cents. On the following day, no quotations for Straits tin were obtainable, but some reclaimed, American-refined tin, a scrap product was reported to have sold at between 50¼ and 50½ cents. Spot Straits was nominally quoted at 59 cents on Sept. 5, a rise of

\$224 a gross ton over the preceding week's closing price. Meanwhile, however, Sterling exchange had slipped from its former pegged price of \$4.68 to around \$4.00. If all American consumers bought in Singapore or London, this would, of course, be an offset to the rise in price, but, with very few exceptions, tin is bought in New York on a dollar and cents basis from importers. The latter refused to quote futures. What little metal changed hands was warehouse stock.

After having advanced 1½ cents to 12½ cents, the highest price since Oct. 5, 1938, electrolytic copper was virtually unobtainable early this month, producers refusing to set any price for the metal. Consumers besieged the large copper sales agencies with requests that they name their price, but most producers thought it best to withdraw from the market for a time and await developments.

The price of zinc climbed to 5½ cents on Tuesday, Sept. 5. On the previous Friday the metal had sold at 4¾ cents. The price of lead was also marked up. —W. C. H.

## Carbide Corp. Acquires All Bakelite Assets

At a recent meeting the board of directors of Union Carbide and Carbon Corp. approved an agreement for the acquisition by Carbide of all the assets of Bakelite Corp. Carbide is a producer of chemical raw materials and Bakelite a user of chemicals in its converting activities. The consummation of the agreement will bring valuable supplementary facilities to both organizations. The coordination of technical knowledge, research, production methods, and distribution facilities of these two organizations is expected to result in the improvement of existing products, the development of new plastics and other chemical compounds, and the discovery of new uses for such materials, it was reported.

Bakelite Corp. has been active in the manufacture and distribution of thermosetting plastics, principally of phenolic types. During recent years an increasing number of Carbide's synthetic organic chemicals have been used as raw materials in various plastics, including those made by Bakelite. Carbide also produces vinyl resins, a recent development being "Vinylite" resin for the laminating interlayer in the new highest safety glass.

Under the agreement there will be distributed to Bakelite stockholders 187,500 shares of Carbide common stock exchanged for Bakelite's assets. Bakelite preferred stockholders will be entitled to receive for each preferred share 1¼ shares of Carbide stock, the remainder of the Carbide stock to be divided ratably among the Bakelite common stockholders. The agreement will become effective upon ratification by the holders of each class of Bakelite stock.

## Finance Convention Sponsored by NAFC

Sponsored by the National Association of Finance Companies, a convention of finance men was held in New York, Sept. 14-15. Among the speakers was Paul G. Hoffman, president, Studebaker Corp. Subjects under discussion at the convention included: bank activity in financing, finance company insurance, dealer reserves and holdbacks, dealer and public relations, premium financing problems and serial card filing.

## Truck Production by Capacities

(U. S. and Canada)

	Seven Months		Per Cent Change	Per Cent of Total	
	1939	1938		1939	1938
1½ Tons and less.....	425,915	308,430	+ 38.3	92.17	93.12
2 to 3 Tons.....	20,205	11,937	+ 69.5	4.37	3.60
3½ Tons and over.....	7,719	5,357	+ 44.3	1.67	1.62
Special and buses.....	8,269	5,494	+ 51.0	1.79	1.66
Total.....	462,108	331,218	+ 39.6	100.00	100.00

## Crosley-Fiat Added To Auto Show List

Two new makes of passenger cars were added to the exhibitors' list for the Fortieth Anniversary of the National Automobile Show in Grand Central Palace, New York, Oct. 15 to 22. They are the Crosley, entered by the Crosley Corp., Cincinnati, Ohio; and the Fiat, entered by the European-American Trade Development Corp., New York, exclusive U. S. agent for this Italian car. The Fiat is the only foreign car in the show thus far. Both of the above-mentioned will be exhibited on the second floor of the Palace. The list for the event now numbers 18 makes of passenger cars and 9 makes of commercial vehicles.

Passenger cars to be shown are Buick, Cadillac, Chevrolet, Chrysler, Crosley, De Soto, Dodge, Fiat, Graham, Hudson, La Salle, Nash, Oldsmobile, Packard, Plymouth, Pontiac, Studebaker and Willys.

Commercial vehicles include Chevrolet, Dodge, Federal, Hudson, Mack, Plymouth, Studebaker, White and Willys.

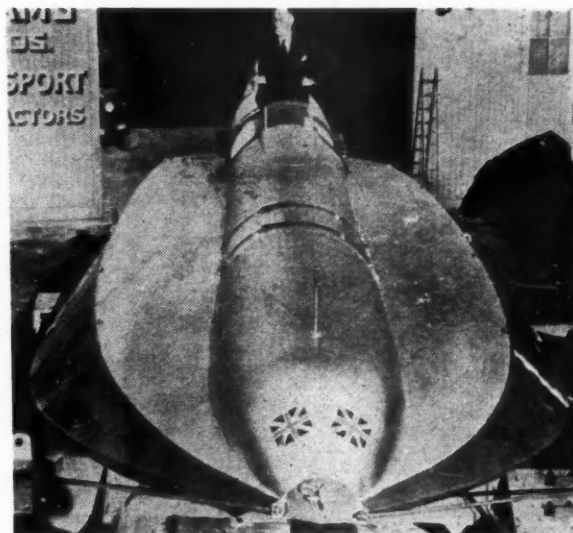
## Cadillac - LaSalle Shipments for 1939

Shipments of 1939 model Cadillacs and La Salles reached 36,611 units, D. E. Ahrens, general sales manager, announced. "This was the fourth best volume for a year-model run in the history of the company," he said. "Only the model years of 1928, 1929 and 1937 surpassed the total."

Final shipment figures give Cadillac-LaSalle an approximate 50 per cent increase over the preceding year. The 1938 model volume was 24,950.

## Record

Sir Malcolm Campbell, well-known speedboat driver and former holder of land speed records, seated on the craft in which he recently set a new world's speedboat record. Skimming over the waters of Lake Coniston, England, Campbell broke his old record and set the new mark at 141.85 m.p.h.



Acme photo

## Curtiss Receives \$5,000,000 Contract

The Curtiss Aeroplane Division of Curtiss-Wright Corp. has received from the U. S. Army a tentative contract for \$5,000,000 worth of speedy observation planes. The new contract swells the military aircraft orders at the Buffalo plant to a total of \$18,000,000, an all-time high for this factory.

How many planes the new contract calls for remained an official secret in Buffalo in accordance with rigid government censorship clamped down on airplane makers a month ago. Informed sources, however, placed the number at upwards of 135.

The new war planes contract is the result of a competitive design which was announced a year ago and engaged in two months ago at Dayton, Ohio. Three Curtiss ships competed in the

contest with craft from most of the leading plane plants in the country.

The Curtiss plane will go into immediate production as soon as the contract is made permanent and materials are obtained. The Curtiss observation plane is designed for aerial observation in cooperation with army corps and divisions. It is a high wing strut-braced monoplane, powered with a Pratt & Whitney Wasp radial engine of advanced design.

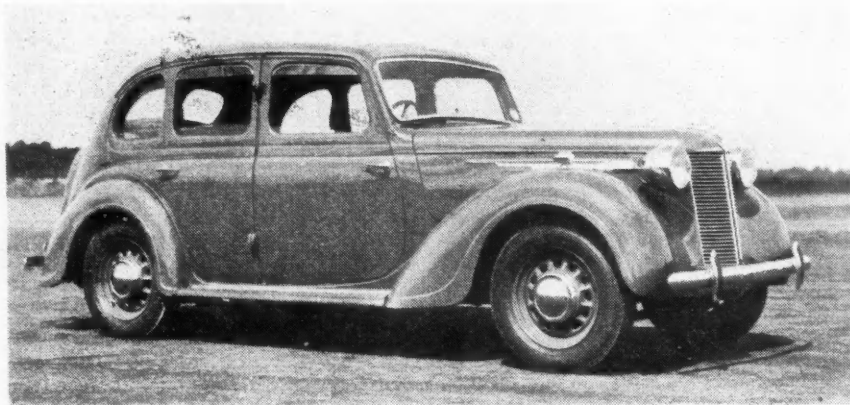
The plane is of all-metal construction and is provided with a retractable landing gear, wing flaps and individually operated wheel brakes.

In comparison with several former types observation airplanes, it is a comparatively small and light ship. It has a low landing speed, making it usable in the small fields which must be used in near proximity to corps and division troops with which the pilot and observer work.

## New Passenger Car Registrations

	JULY	JUNE	JULY	SEVEN MONTHS		Per Cent Change, 7 Months, 1939 over 1938	Per Cent of Total Seven Months		NINE MONTHS MODEL YEAR		
	1939	1939	1938	1939	1938		1939	1938	1939	1938	Per Cent Change
Chevrolet.....	52,096	57,674	37,703	383,991	277,409	+ 38.8	23.44	24.71	497,975	382,824	+ 27.1
Ford.....	47,043	45,009	30,499	299,825	235,329	+ 27.8	18.30	20.96	366,411	282,699	+ 29.4
Plymouth.....	30,826	31,640	22,479	229,453	159,278	+ 44.0	14.00	14.18	296,745	208,957	+ 42.0
Dodge.....	17,796	18,154	8,162	126,515	62,954	+101.0	7.72	5.61	154,584	88,565	+ 74.8
Buick.....	15,576	18,375	12,807	124,131	93,163	+ 33.0	7.58	8.30	161,962	128,971	+ 27.5
Pontiac.....	11,902	14,499	7,001	94,181	57,717	+ 63.0	5.75	5.14	119,921	80,604	+ 49.0
Oldsmobile.....	10,649	12,485	6,784	84,798	54,586	+ 55.2	5.18	4.86	110,201	74,735	+ 47.2
Chrysler.....	5,895	5,978	3,728	43,527	29,045	+ 50.0	2.66	2.59	54,324	41,408	+ 31.1
Studebaker.....	8,003	8,263	3,045	43,325	20,371	+112.5	2.64	1.61	52,793	28,072	+ 88.6
Mercury.....	6,394	6,139		38,702			2.36		45,537		
De Soto.....	5,203	5,204	2,717	33,661	21,692	+ 55.0	2.05	1.93	41,746	30,875	+ 35.1
Nash.....	4,180	4,704	2,612	33,014	20,085	+ 65.0	2.02	1.79	38,618	27,431	+ 41.0
Hudson.....	4,250	4,783	2,962	30,372	24,099	+ 26.0	1.85	2.15	39,779	33,388	+ 19.6
Packard.....	3,120	4,504	3,782	27,555	29,355	- 6.1	1.68	2.61	36,822	40,164	- 8.7
La Salle.....	1,634	1,852	1,083	13,089	8,354	+ 56.7	.80	.74	17,693	11,793	+ 50.0
Lincoln.....	1,697	1,557	1,291	12,066	10,770	+ 12.0	.74	.96	15,426	14,210	+ 8.5
Cadillac.....	920	1,077	770	7,861	6,455	+ 22.0	.48	.57	10,517	7,712	+ 36.2
Willys-Overland.....	943	1,047	982	6,966	7,934	- 12.0	.43	.71	8,888	12,387	- 28.2
Graham.....	400	429	273	2,841	2,742	+ 3.8	.17	.24	3,555	4,102	- 13.5
Hupmobile.....	71	115	114	741	705	+ 5.0	.05	.06	842	611	+ 4.0
Bantam.....	132	113		714			.04		714		
Crosley.....	541	90		631			.04		631		
Fiat.....	8	6		66					66		
Miscellaneous.....	29	44	102	385	876	- 56.1	.02	.08	691	1,322	- 47.7
<b>Total.....</b>	<b>229,308</b>	<b>243,741</b>	<b>148,896</b>	<b>1,638,410</b>	<b>1,122,919</b>	<b>+ 45.9</b>	<b>100.00</b>	<b>100.00</b>	<b>2,006,243</b>	<b>1,499,010</b>	<b>+ 38.0</b>
Chrysler Corp.....	59,720	60,976	37,086	433,156	272,969	+ 58.8	26.43	24.31	547,399	368,805	+ 48.2
Ford Motors Corp.....	55,134	52,705	31,790	350,593	246,099	+ 42.7	21.40	21.92	427,376	296,909	+ 44.0
General Motors.....	92,777	105,962	66,148	708,051	497,684	+ 42.8	43.22	44.32	908,269	684,639	+ 33.0
All Others.....	21,677	24,098	13,872	146,610	106,167	+ 38.0	8.95	9.45	183,199	147,657	+ 24.1





Austin Twelve-Four 5-passenger sedan

## British to Consider Used Car Scrapping

### Austin's New Twelve-Four Announced; Price Reduction on Vauxhall Models

At a recent council meeting of the English Motor Agents' Association a used car scrapping scheme was put forward and discussed; as a result a special committee was set up to consider it in detail and make recommendations.

In broad outline the scheme is as follows: It would be part of every dealer's contract with manufacturers to hand over to an appointed scrapping firm any used car coming into his possession with a Motor Trade Association "book price" value of 2½ per cent or less of the original list price. Dealers would deliver cars f.o.b. to the scrapping yard and would receive 2½ per cent of the original list price. Manufacturers would be asked to subsidize the scheme by adding 1 per cent to their retail list prices of new cars sold during the operation of the scheme.

A charge of 15 shillings would be made by the scrapping firm to cover establishment and maintenance costs and scrapping; the firm would also receive 5 per cent of the net proceeds from the sale of scrap material, the balance going toward the cost of operating the scheme, including the purchase of cars from dealers.

The originators of this plan claim that it would be self-supporting (apart from the manufacturers' 1 per cent subsidy), financed in a practical manner and insure, by scrapping being undertaken by a firm of repute (specified in the proposals), that all cars would be scrapped completely.

#### New Austin Twelve-Four

An entirely new version of the Austin Twelve-Four was announced in England on Aug. 29. The wheelbase is 104½ in.; the overall length 14 ft. 3 in. and the overall width 5 ft. 8 in. Price of the five-passenger sedan is £225, the sliding roof sedan with leather upholstery

and certain other refinements is £235. These prices are £10 more than the corresponding but smaller cars of the superseded type.

The engine is of the same dimensions and general design (1535 cc. side valves, aluminum cylinder head, three-bearing crankshaft, anodized aluminum pistons and Zenith downdraught carburetor) but pump water circulation is now used—with thermostatic valve and by-pass—and the connecting rod ends are drilled to spray oil into the cylinder bores. Another new feature is in the flexible mounting of the engine. There are two "live" rubber supports at the front and a single wide one at the rear; but the latter is supported by a frame cross member which itself rests on rubber blocks at each end. The frame is new with extensive X-bracing and a

(Turn to page 290, please)

## MEN . . . . .

C. A. Criqui, Sr., founder and for 33 years president of the Sterling Engine Co., has announced he has turned the actual operation of his company over to younger executives in an effort to assume a less active part in the direction of the corporation. He will serve as chairman of the board of directors. The active heads of the company will be S. H. Logan, the new president, and A. F. Vars who fills the newly created post of executive vice-president. Another member of the new board of directors is F. G. Cooban, vice-president and general manager of the Hewitt Rubber Co.

A special meeting of the Dodge Quarter Century Club was held to honor E. M. Carver, vice-president, G. A. Radomski and W. Middleton who have celebrated 50 years of continuous service with the Dodge Manufacturing Corp., South Bend.

Edward Ranck has been appointed to the sales personnel of the hoist and body division of Gar Wood Industries, Inc.

M. E. Lord has been appointed manager of the Fort Wayne works of General Electric Co. to succeed N. Currie, Jr., who relinquishes that position to become vice-president in charge of manufacturing.

General Tire and Rubber Co., recently elected to membership in the Association of National Advertisers, will be represented in the association by R. H. Harrington.

B. G. Kirkwood has become Buffalo district manager for the Nicholson (Top of next column)

## New Truck Registrations

	July 1939	June 1939	July 1938	SEVEN MONTHS		Per Cent Change, 7 Months 1939 over 1938	Per Cent of Total Seven Months	
				1939	1938		1939	1938
Chevrolet	15,432	14,049	11,225	104,315	76,348	+ 37.0	35.53	33.27
Ford	12,514	10,606	9,425	77,973	63,992	+ 21.8	26.56	27.88
International	5,744	5,105	4,782	36,421	32,055	+ 13.9	12.41	13.96
Dodge	4,562	4,442	3,236	31,619	22,835	+ 38.4	10.77	9.95
G. M. C.	2,872	2,740	1,675	19,444	12,444	+ 56.2	6.62	5.42
Plymouth	946	889	660	5,874	4,880	+ 20.4	2.00	2.13
Mack	541	588	347	3,709	2,258	+ 64.4	1.26	.98
Diamond T	436	408	382	2,867	2,623	+ 9.5	.98	1.14
White	358	434	298	2,562	2,114	+ 21.3	.87	.92
Studebaker	229	209	116	1,309	1,157	+ 13.0	.44	.50
Autocar	300	162	129	1,222	1,012	+ 20.6	.42	.44
Brockway	170	177	99	1,056	708	+ 49.0	.36	.31
Willys-Overland	133	185	182	962	1,227	- 21.5	.33	.53
Divco	117	90	177	898	785	+ 14.3	.31	.34
Federal	116	123	117	850	811	+ 4.9	.29	.35
Reo	31	53	264	771	1,735	- 55.5	.26	.76
Bantam	53	50		328			.11	
Hudson	43	47	67	317	545	- 41.8	.11	.24
Sterling	28	25	34	193	148	+ 30.3	.07	.06
Indiana	21	12	39	127	281	- 54.7	.04	.12
F. W. D.	34	10	23	117	205	- 42.8	.04	.09
Miscellaneous	67	78	198	639	1,379	- 53.6	.22	.61
Total	44,747	40,482	33,475	293,573	229,542	+ 28.0	100.00	100.00

Universal Steamship Co., automobile carriers. He succeeds F. L. Hewitt, Jr., who has been made vice-president and general manager.

Dudley P. K. Wood, former assistant vice-president and director of the American Machine & Foundry Co., is the latest appointee to Secretary of Commerce Hopkins' staff who have been assigned a wide scope of studies covering construction, wartime mobilization and other industrial problems.

G. B. Comfort has been appointed manager of sales promotion for Schramm, Inc.

C. L. Huston, Jr., assistant staff supervisor of employment for American Rolling Mill Co., has resigned, and will join Lukens Steel Co. as director of personnel.

R. B. Nichols has been elected secretary of Bantam Bearings Corp.

C. E. Webster has been appointed general manager of Timken Roller Bearing Co., Ltd., Toronto, Ont.

J. S. Bartek, formerly chief engineer of the Modern Tool Works, Rochester, has been added to the engineering staff of Pioneer Engineering & Manufacturing Co., Detroit.

## Administration Studies Plans to Prevent "Peacetime Profiteering"

*Ourselves and Government—A Check List Of Federal Action Corrected to Sept. 8*

### DEPARTMENT OF LABOR

**STEEL WAGE CASE.** The temporary restraining order prohibiting the Secretary of Labor from enforcing her minimum wage-order under the Walsh-Healey Public Contracts Act for the steel industry has been continued in effect by the Court of Appeals for the District of Columbia pending further proceedings before the Federal District Court.

### DEPARTMENT OF JUSTICE

Acting on instruction from the President, Attorney General Murphy, in conjunction with the Department of Commerce, is studying plans to prevent peacetime "profiteering." Apprehension is felt by the administration that war demands of France and England will develop excessive prices in this country, especially of such basic materials as steel, oil, machinery, etc., and therefore is considering price control legislation, which, if decided upon, will probably be asked at a special session of Congress which the President is expected

to call at some indefinite date, primarily to ask revision of the Neutrality Act. The flood of orders from abroad already has resulted in increased export prices of steel and other commodities, with indications of early advances in domestic prices. It was reported that automobile manufacturers are trying to cover future steel requirements at present price levels but are meeting with resistance. No fourth quarter sales will be made until prices are announced. Peacetime control of prices is unusual and it may be difficult to get necessary legislation.

### FEDERAL TRADE COMMISSION

**F. O. B. PRICE CASE.** Hearing in Ford case has been postponed to Sept. 26 from Sept. 19. Testimony in GM case closed. Commission charges both companies engaged in misleading price advertising.

**VS. GENERAL MOTORS.** Date for continuing rebuttal testimony advanced to Sept. 11 from Sept. 19. FTC alleges GM dealers are required to handle GM parts to exclusion of others.

**SIX PER CENT CASE.** Unconfirmed report that cease and desist order soon will be issued, requiring abandonment of so-called misleading representation in finance plan advertising and substitution of advertising making it clear present plan does not provide amortization. Case involves Ford and GM on which final arguments have been made.

**FAIR TRADE PRACTICE RULES.** No indication when rules will be promulgated.

### TEMPORARY NATIONAL ECONOMIC COMMITTEE

Discounts on quantity purchases allowed the automotive and other large consuming industries will be given considerable attention, it is reported, at the steel hearings to be resumed about Oct. 15, when the Department of Justice will present what is said will be the most comprehensive study ever made of the iron and steel industry.

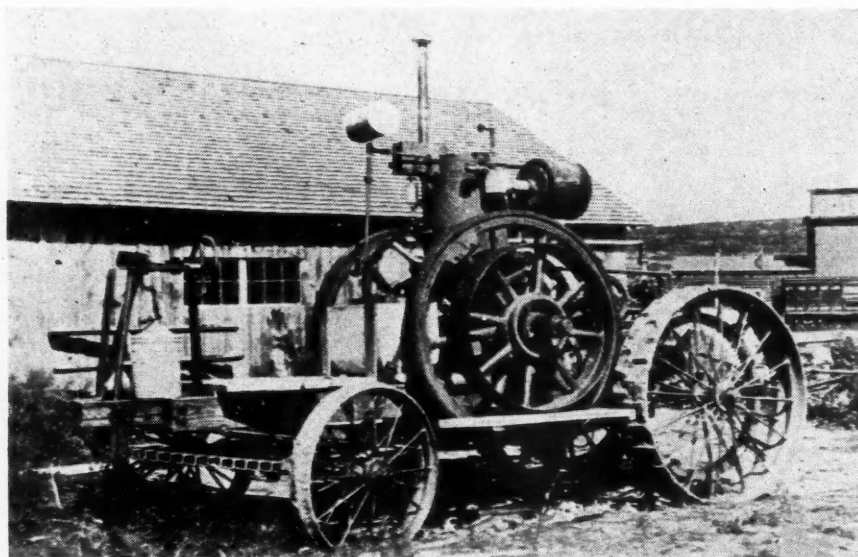
### WAR RESOURCES BOARD

Board meeting almost constantly in view of the European war and possibility of the United States becoming involved. Studying plans, broadly patterned after old War Industries Board, for wide control of price, production and conservation. Heading the board is Chairman Edward R. Stettinius, Jr., of the United States Steel Corp. and included among other members is director John Lee Pratt of General Motors Corp.

## Seven-Month Automotive Exports and Imports

	JULY 1939		JULY 1938		SEVEN MONTHS ENDED JULY			
					1939		1938	
	No.	Value	No.	Value	No.	Value	No.	Value
<b>EXPORTS</b>								
Automobiles, parts and accessories		\$ 18,519,924		\$ 17,469,175		\$ 162,776,558		\$ 172,037,610
<b>PASSENGER CARS</b>								
Passenger cars and chassis	8,260	4,787,662	9,100	5,695,012	97,996	59,973,461	101,532	63,562,417
Low price range \$850 inclusive	7,650	4,102,434	8,076	4,582,149	87,567	48,927,941	88,562	49,528,298
Medium price range over \$850 to \$1,200	504	489,779	882	857,538	8,960	8,558,604	11,048	10,792,237
\$1,200 to \$2,000	66	94,727	111	163,533	1,195	1,770,456	1,535	2,274,513
Over \$2,000	40	100,722	31	91,792	274	716,460	387	987,369
<b>COMMERCIAL VEHICLES</b>								
Motor trucks, buses and chassis (total)	10,772	6,328,508	7,210	4,639,670	75,357	46,053,459	73,175	46,727,993
Under one ton	1,671	669,721	1,218	482,802	11,439	4,790,879	11,337	4,789,643
One and up to 1½ tons	7,776	4,040,687	4,634	2,578,879	52,603	28,471,102	49,003	26,784,051
Over 1½ tons to 2½ tons	1,018	1,075,787	888	626,804	8,154	7,205,051	8,010	6,534,782
Over 2½ tons	254	503,700	452	924,813	2,650	5,156,218	3,852	7,895,416
Bus chassis	53	38,613	18	26,372	511	430,203	973	724,101
<b>PARTS, ETC.</b>								
Parts except engines and tires								
Automobile unit assemblies		2,784,100		3,121,585		24,202,931		30,599,401
Automobile parts for replacement (n.e.s.)		3,217,922		2,927,570		23,005,593		21,645,550
Other automobile accessories (n.e.s.)		311,647		239,963		2,230,727		1,986,010
Automobile service appliances		442,410		393,401		3,621,710		2,713,732
Airplanes, seaplanes and other aircraft	122	5,805,220	72	3,572,233	855	36,217,591	507	24,578,081
Parts of airplanes, except engines and tires		977,356		1,527,946		8,915,815		14,149,850
<b>INTERNAL COMBUSTION ENGINES</b>								
Stationary and portable								
Diesel and semi-Diesel	35	74,626	41	86,729	275	1,047,018	308	1,367,761
Other stationary and portable								
Not over 10 hp.	956	57,460	2,369	100,879	7,539	443,901	8,478	506,715
Over 10 hp.	250	94,937	449	199,102	1,086	621,423	2,589	1,116,378
<b>Engines for:</b>								
Motor trucks and buses	2,314	292,314	1,830	193,072	16,251	1,978,441	17,508	1,930,648
Passenger cars	363	191,548	2,798	233,782	18,106	1,567,905	29,271	2,389,141
Aircraft	172	1,191,765	159	1,091,754	999	6,968,935	769	4,437,143
Accessories and parts (carburetors)		231,324		199,120		1,616,679		1,665,989
<b>IMPORTS</b>								
Automobiles (durable)	66	55,034	35	42,786	322	238,356	361	231,644





Froelich's tractor standing before the shop in which it was built, in 1892.

## Commemorate First Gasoline Tractor

### Unveil Monument To John Froelich

Ceremonies at the little village of Froelich, Iowa, Aug. 27, marked the unveiling of a granite monument and bronze plate commemorating the invention by John Froelich in 1892, in that village, of the first practical gasoline tractor with both forward and reverse speeds.

John Froelich was of an inventive turn. While operating a straw-burning steam threshing outfit in South Dakota, he noted the difficulty of maintaining steam during high winds and the corroding effect of the region's alkali water on the boiler.

Upon return to his elevator and feed mill at Froelich, he experimented with the problem of developing a traction power unit which would function in any weather and be free from the trouble of hauling water. Going to Cincinnati, Froelich purchased a Van Dusen stationary gas engine of one cylinder with 14-in. bore and 14-in. stroke. This engine was placed on wooden beams mounted on a steam running gear. Steam engine parts such as shafting, gears and pulleys were utilized to augment special parts designed and cast by Froelich and his helper, Will Mann.

After many adjustments the cumbersome model chugged slowly out of the shop and down the road where a neighbor was threshing. It worked. Later this tractor was shipped to Langford, South Dakota, in the fall of 1892, and for more than 50 days successfully operated a 40 by 60 threshing machine.

In 1893 John Froelich organized the Waterloo Gasoline Traction Engine Co. of Waterloo, Iowa. The company met with many reverses in those early years before finally placing a practical tractor on the market under the trade name of



John Froelich

"Waterloo Boy." The John Deere Co. absorbed the Waterloo concern in 1918.

John Froelich, the inventor, realized little financially out of his venture and received scant recognition during his lifetime. He spent his last years in St. Paul, where he died May 23, 1933.

The monument and marker, standing on a grassy terrace, was planned and completed by villagers and farmers of the community as a tribute to their friend, who gave them their first workable gasoline tractor.

## Automobile Payrolls Well Over Last Year

Employment in the automobile industry during the first half of this year was a third more than in the like portion of last year, while average weekly payrolls were more than half again

those of the first six months of 1938.

On the basis of indices issued each month by the U. S. Bureau of Labor Statistics, the number of workers in the automobile industry averaged 403,000 against 301,000 in the comparable portion of last year, the Automobile Manufacturers Association states.

Meanwhile, wages paid out during the same period showed an even sharper increase, amounting to 12 million dollars a week, up 56.9 per cent from the first half of 1938.

## Machine Tool Show —Congress Postponed

In view of the outbreak of the war in Europe, the members of the National Machine Tool Builders' Association have postponed indefinitely the Machine Tool Show which was to have been held at Cleveland, Oct. 4 to 13. This also involves the postponement of the Machine Tool Congress, a series of meetings which were sponsored by a group of nine engineering and technical societies, and which were to have been held during the Machine Tool Show.

Mr. Whipp, president of the association, said, "The members of the association feel that the greatest contribution the industry can make to the welfare of the nation at this time is to concentrate their entire efforts on the production of the greatest possible number of machine tools. Under the circumstances, the industry and its customers cannot afford the time of their key men for a Machine Tool Show, and postponement is felt to be the wisest course."

## Buick Announces Reduced Prices

Price reductions ranging from \$17 to \$281 on nine of Buick's 1940 models, basic prices on two new series to be introduced this year, and addition of numerous accessories as standard equipment at no extra cost on remaining models, were announced by Harlow H. Curtice, president and general manager.

Buick's prices, compared with last year's, follow:

		1940	1939	Reduction
<b>Series 40 Special</b>				
46 Business coupe	.....	\$895	\$895	....
46S Sport coupe	.....	950	950	....
48 Two door touring sedan	.....	955	955	....
41 Four door touring sedan	.....	996	996	....
46C Convertible coupe	.....	1077	1077	....
41C Convertible Phaeton with under-seat heater	.....	1355	1433	\$78
<b>Series 50 Super</b>				
56S Sport coupe	.....	1058	...	New
51 Four door touring sedan	.....	1109	...	New
<b>Series 60 Century</b>				
61 Four door touring sedan	.....	1211	1246	35
66C Convertible coupe	.....	1343	1343	....
61C Convertible Phaeton with under-seat heater	.....	1620	1740	120
<b>Series 70 Roadmaster</b>				
76S Sport coupe	.....	1277	...	New
71 Four door touring sedan	.....	1359	...	New
<b>Series 80 Limited (133" wheelbase)</b>				
81 Four door touring sedan with under-seat heater	.....	1553	1570	17



81F Formal sedan with under-seat heater .....	1727	1785	58
81C Convertible Phaeton with under-seat heater. 1952	2010		58
<b>Series 90 Limited (140" wheelbase)</b>			
91 Six passenger four door sedan with under-seat heater .....	1942	2101	159
90 Eight passenger touring sedan with under-seat heater .....	2096	2377	281
90L Limousine with under-seat heater .....	2199	2480	281

The new prices include Federal tax and are quoted as the retail delivery price fully equipped at the factory in Flint. The only charges to be added are transportation based on railroad rates and local taxes.

## Men and Machines

(Continued from page 276)

subjected to the impact of the high velocity atomized rinse water from numerous angles. Standard sizes are: 24 in. by 24 in. by 36 in. deep with 21-in. diameter top opening; 30 in. by 30 in. by 36 in. deep with 27-in. diameter top opening; and 36 in. by 24 in. by 36 in. deep with 33 in. by 21 in. oval top opening. Both types also can be furnished to any square or rectangular dimensions with round or oval top openings to suit rack and work dimensions and other requirements—H. E. B., Jr.

## Publications Available on Machine Tools

Bonney Forge & Tool Works, Allentown, Pa., has issued a catalog which illustrates and describes 995 different tools and 102 different, complete tool sets.\*

The National Acme Co., Cleveland, has issued catalog No. M-40 on Acme-Gridley 4-6-8 spindle bar machines.\*

Bulletin No. 442, published by the Farrel-Birmingham Co., Ansonia, Conn., describes the Sykes 2-C gear generating machine for generating gears up to 25-in. diameters.\*

The U. S. Tool Co., Ampere (East Orange), N. J., has prepared bulletin No. 36 which covers its complete line of "Multi-Millers," high-speed automatic production milling machines.\*

Bulletin B-8 of Curtis Pneumatic Machinery Co. illustrates and describes its hydraulic lifting cylinders.\*

A folder by Chicago Pneumatic Tool Co. describes and gives specifications concerning its super-safety balancers.\*

Carboloy Co., Inc., has issued a bulletin giving the latest methods of torch brazing Carboloy tools.\*

Publication No. GEA-3058A of General Electric Co. covers its ignitron contactors for spot and projection welding.\*

\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

## Australia's Use of Retreads Increases

Statistics of the Australian rubber industry indicate an increasing use of retread tires in that country. Commerce



**J. R. Davis**

—general sales manager of the Ford Motor Co., pictured as he addressed 120 star Ford salesmen at a luncheon at the New York World's Fair. The salesmen heard Davis proclaim "a new cycle" for the company and predict that 1940 would mark the start of "the greatest ten years in the history of the Ford Motor Co."

Department information shows that Australian production of new tires, for motor cars, trucks, motorcycles and cycle pneumatics amounted to only 2,-

290,914 units in 1937-38. The retreading industry turned out 16.6 per cent as great a value of products and 18.6 per cent as great a number of tires as the entire new tire industry.

## Good Employee Relations In Clark Annual Report

As one phase of an industrial relations program which has occupied a good deal of the time of executives of the company for the last several months, the Clark Equipment Co. now comes forward with a "President's Annual Report to Employees," which becomes a pioneering document in the field. Profusely illustrated, the 31-page neatly bound report presents to the employees a comprehensive story of the company's history, details of its products and their variety of uses, the various types of equipment used by the company and a discussion of their maintenance and replacement problems.

Particular emphasis was placed upon the presentation of the company's financial status. The company's liabilities, assets, current expenses and income were reduced to a "per employee" figure and the whole explained in an unusually clear manner. The employee is given information concerning the need for non-productive departments, workers and materials and a breakdown is presented illustrating what the company did with every dollar received from its customers. The interrelation of the various productive and non-productive departments and workers, together with their need for continued close cooperation, is forcefully illustrated.

## AUTOMOTIVE INDUSTRIES

### Summary of Automotive Production Activity

**BUSES** Deliveries slightly exceeding same period last year. Several important inquiries are reported and most producers are quite optimistic concerning outlook for immediate future. Production in general appears to be over 50 per cent of capacity.

**TRUCKS** Slight improvement shown with present production schedules expected to hold or improve for remainder of year. Factory branches are optimistic and back orders are still quite a problem with some manufacturers. European conditions have, thus far, failed to affect production plans.

**TRACTORS** Executives have "fingers crossed" regarding European situation and state no one can foretell movements of next few months. Most factories operating on seasonal schedules and hope for slight improvement for remainder of year. Slight impetus reported due to rise in corn prices and consequent boost in tractor-corn picker sales.

**AUTOMOBILES** Output of cars and trucks for first half of September estimated to be 63,000 units. Substantial gains expected for last half of month, although top figures are not expected to be reached until some time in October.

**MARINE ENGINES** Production schedules remain low although last two weeks have shown slight upturn in demand for Diesels. Considerably better-than-average year is reported by principal distributors.

**AIRCRAFT ENGINES** Backlogs of domestic orders for aircraft, engines and parts will keep all builders under heavy production schedules for some time to come.

This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.

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## Motor Vehicle License Revenue

The 48 states collected \$306,000,000, or \$2.38 per capita, from motor vehicle licenses, in their respective fiscal years ended in 1937, according to a report released by Director William Lane Austin, Bureau of the Census, Department of Commerce.

Revenues of the states from motor vehicle license taxes have increased substantially during the past twenty years, both in the total and per capita amounts collected. Due to new types of revenue during the past few years, however, the percentage of all revenues represented by motor vehicle licenses has remained fairly constant except for the reduction to 7.5 per cent in 1937. In 1915, the license tax on motor vehicles was not separately reported, but comprised the major portion of \$14,900,000 reported collected from non-business license taxes.

## Four Wheel Drive Expansion Program

The Four Wheel Drive Auto Co., Clintonville, Wis., has disclosed a program for expansion of its manufacturing operations to include production of numerous parts used in its trucks. According to W. A. Olen, president, the company now is manufacturing about

two-thirds of all the transmissions and axles it requires and will now also start production of cabs for its trucks. Last year installation of new and modern machinery and the institution of new factory methods made it possible for FWD to build 1674 additional different parts for its trucks in its own shops. About one million parts are used in the 22 models manufactured. This program of "self-production" enabled the company to reduce costs, particularly overhead; increase production efficiency and turn out a more uniform product, it was said. It is planned eventually to manufacture nearly all of its own parts with the exception of engines.

## Cummins Diesels For "Snow Cruiser"

Two 150-hp. Diesel engines are now under construction at the Cummins plant in Columbus, Ind., for use in the Admiral Richard Byrd Antarctic Expedition "snow cruiser", now being built at the South Chicago Pullman works. The \$150,000 job is a project of the research foundation of the Armour Institute of Technology.

The land cruiser is 55 ft. overall, 15 ft. wide and 15 ft. high, designed to carry a crew of four, with a cruising range of 5,000 miles. Its completion is expected by Oct. 1.

## Passenger Car and Truck Production (U. S. and Canada)

	July 1939	June 1939	July 1938	SEVEN MONTHS		
				1939	1938	Per Cent Change
Passenger Cars—U. S. and Canada						
Domestic Market—U. S.	142,305	233,311	96,975	1,621,701	924,060	+76
Foreign Market—U. S.	8,390	13,393	9,866	106,693	119,298	-11
Canada	5,112	10,585	5,273	75,080	81,375	-8
Total	155,807	257,289	112,114	1,803,474	1,124,733	+60
Trucks—U. S. and Canada						
Domestic Market—U. S.	43,880	49,025	26,486	343,011	216,636	+58
Foreign Market—U. S.	14,584	13,991	8,116	91,287	84,792	+8
Canada	4,023	3,930	3,734	27,810	29,790	-7
Total	62,487	66,946	38,336	462,108	331,218	+40
Total—Domestic Market—U. S.	186,185	282,336	123,461	1,964,712	1,140,696	+72
Total—Foreign Market—U. S.	22,974	27,384	17,982	197,980	204,090	-3
Total—Canada	9,135	14,515	9,007	102,890	111,165	-7
Total—Cars and Trucks—U. S. and Canada	218,294	324,235	150,450	2,265,582	1,455,951	+56

## Monthly Motor Vehicle Production (U. S. and Canada)

	PASSENGER CARS		TRUCKS		TOTAL MOTOR VEHICLES	
	1939	1938	1939	1938	1939	1938
January	291,444	168,890	62,502	58,062	353,946	226,952
February	250,897	151,133	61,244	51,464	312,141	202,597
March	312,392	186,341	77,097	52,106	389,489	238,447
April	286,200	190,111	68,063	47,818	354,263	237,929
May	249,455	168,599	63,759	41,575	313,214	210,174
June	257,289	147,545	66,946	41,857	324,235	189,402
July	155,807	112,114	62,487	38,336	218,294	150,234
August		61,687		35,259		96,946
September		69,449		20,174		89,623
October		192,906		22,380		215,285
November		335,767		54,538		390,495
December		341,524		65,492		406,960
Total		2,126,068		523,161		2,655,171

September 15, 1939

## PUBLICATIONS

A reprint of the British Rubber Publicity Association's book—"Rubber in Chemical Engineering"—has been issued. The book deals with the properties and chemical resistance of rubber, rubber linings for tanks and similar equipment, rubber paints, cements, etc.\*

A booklet, "Standard Inspection Requirements for Motor Vehicles," gives the recommendations endorsed by the American Association of Motor Vehicle Administrators. The booklet is published by the American Standards Association, 29 W. Thirty-ninth St., New York City. Copies are 25 cents each.

A new catalog featuring custom-built Solenoids, Coils and Transformers has been issued by Dean W. Davis & Co., Inc. Graphs giving technical information, plus illustrations of some of the applications of solenoids to modern machines are included.\*

A new catalog, which forms a complete handbook of industrial first-aid supplies, has been issued by Davis Emergency Equipment Co.\*

Bulletin 1206 of C. J. Tagliabue Mfg. Co. illustrates the new TAG—A.S.T.M. bomb for determining gum stability of gasoline.\*

Two annual statistical reports in booklet form have been issued by the National Safety Council, one is "Accident Rates in the Machinery Industry", the other, "Accident Rates in the Automobile Industry."\*

Two tractor catalogs have been published by Allis-Chalmers tractor division. One covers its model "S", the other its models "K" and "WK".\*

\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

## Polk Estimate Shows August Sales Increase

New passenger car sales in the United States in August surpassed those in the same month a year ago by approximately 50 per cent, it was estimated by R. L. Polk & Company. The estimate is based on returns from 115 major cities covering the first 22 days of last month.

On the basis of the same principal-city estimate, Polk reports that August registrations are expected to show about an 18 per cent decline from July, 1939, registrations. This is closely in line with seasonal trend.

All portions of the country share in the July to August decline, according to Polk's early returns. The respective decreases for the various sections are as follows: New England, 9.57 per cent; Middle Atlantic, 22.17 per cent; East North Central, 17.19 per cent; West North Central, 31.44 per cent; South Atlantic, 14.76 per cent; East South Central, 17.16 per cent; West South Central, 15.77 per cent; Mountain Region, 9.62 per cent; and Pacific Region, 5.58 per cent.

## Harry E. Heath

Harry E. Heath, vice-president and general sales manager of the marine engine division of the Chrysler Corp., died recently in Detroit. Mr. Heath was 44 years old.

Automotive Industries

## Collier's to Boost "Preventive Service"

Pointing a message directly to the car owners among its readers, *Collier's*, in its Nov. 4 issue, will inaugurate a series of two-page and full-page advertisements featuring "P. S.—Preventive Service. Sponsored by *Collier's* for Motor Car Owners."

Stating that, "In addition to all the automotive product advertising, every dealer, jobber and manufacturer has hoped for the time when some independent authoritative source would tell the motorists of America the general automotive service story," *Collier's* points out that there is no better example of the value of preventive methods than the comfort, beauty and economy achieved by preventive dentistry. In like manner *Collier's* will seek to emphasize the comfort, economy and safety in motoring achieved by preventive automotive service.

The series is expected to run for at least a year, the opening advertisement concerning itself with the preventive service and necessary checking points for assuring maximum car performance throughout the winter months. Specifically, the advertisement covers the cooling system—the proper use of anti-freeze compounds, the necessity of an unclogged water-tight radiator, efficient hose and hose connections and the importance of a fan belt in good condition. Points on winter lubricants and oil filter efficiency are discussed. The importance of the electrical system is stressed with preventive service information on the battery, wiring, lights, distributor and spark plugs.

Also discussed is the necessity for good brakes, good tires and emergency tire chains for complete safety in winter driving. Attention is given to safety and comfort accessories—bad weather lights, windshield wipers, defrosters and heaters. Appearance protection is also stressed in pointing out the severity of winter weather and its effect on car finish unprotected by wax or polish of some sort. Subsequent advertisements will cover other phases of preventive maintenance.

Beginning in advance of, and continuing throughout the period of the pages of *Collier's* will be a series of special inserts in *Automobile Trade Journal*, *Motor Age*, *Motor World Wholesale*, *Motor* and *Jobber Topics*. Backing up the *Collier's* presentation in these publications will be advertising addressed to the maintenance trade.

In the first of this series, beginning in the September issues of the above publications, is reproduced the two-page advertisement which will appear in *Collier's* issue of Nov. 4. In addition to the reproduction, *Collier's* points out in the insert that knowledge of preventive service is a real consumer need, and that the magazine is tackling a gigantic job which no one manufacturer or single group in the industry could undertake. Remarking that its task is the biggest automotive consumer move-

ment ever undertaken by a national magazine, *Collier's* indicates that it is in an excellent position to gain for preventive service the attention it merits because of the fact that the magazine's more than two and three-quarter millions of family readers own more than one billion dollars worth of motor cars.

## ADVERTISING

Europe's war has projected a shadow over the advertising business, with manufacturers and advertising agencies alike wondering whether cancellation of appropriations will occur as they did during the first year or two of the World War. A group of Ford dealers cancelled a series of "spot" radio programs, and the Ford Motor Co. announced that it will use only American citizens as artists on the Sunday Evening Symphony, resuming Sept. 24. With new car announcements in the offing, together with the models already being publicized, automobile advertising appropriations will probably hold up, for the time being, at least.

General Motors Corp. again led all automotive advertisers in the volume of newspaper space with a total of \$5,131,475 spent during 1938, but

dropped from the top of the combined national list to third place, having been nosed out by two tobacco manufacturers. Chrysler followed with \$3,391,903, and Ford Motor Co. was in sixth place, or third largest newspaper advertiser among the automotive groups, with an expenditure of \$2,576,835 for the year, according to figures released by the American Newspaper Publishers' Association. Hudson was the fourth largest automobile advertiser with \$946,811; Nash-Kelvinator fifth with \$596,189; Packard sixth with \$384,618; and Studebaker seventh with \$276,270 spent on newspaper advertising during the year. Major oil companies spent a total of \$5,140,028 in newspaper space, the figures show, and smaller fuel concerns brought the gasoline and oil group up to \$6,860,866. Automotive, including cars, trucks, gasoline and oil, tires, tractors, aircraft and accessories totaled \$21,873,391, or about one-seventh of the total 1938 newspaper expenditures.

Clay H. Hollister, Jr., New York, has joined Libbey-Owens-Ford Glass Co., Toledo, as distributors' sales consultant.

Magazines, newspapers and radio will be used by Commercial Solvents Corp. to warn motorists of freezing weather and urge the use of "Nor'way" anti-freeze. Maxon, Inc., is the advertising agency.

## Estimated Dealer Stocks of New Passenger Cars

	July	August	September	October	November	December
1938						
Production—U. S. Domestic Market †	96,975	53,955	60,177	171,371	295,366	305,900
Retail Sales—U. S. †	153,426	123,711	90,629	134,984	241,009	241,623
Change in Inventory	-56,451	-69,756	-30,452	+36,387	+54,357	+64,277
Inventory, first of month	263,618	207,167	137,411	106,959	143,346	197,703
1939	January	February	March	April	May	June
Production—U. S. Domestic Market †	263,225	223,745	279,148	257,058	222,909	233,311
Retail Sales—U. S. †	180,651	165,841	276,301	265,756	275,457	254,304
Change in Inventory	+82,574	+57,904	+2,847	-8,698	-52,548	-20,993
Inventory, first of month	261,980	344,554	402,458	405,305	396,607	344,059
1939 (continued)	July	August	September	October	November	December
Production—U. S. Domestic Market †	142,305					
Retail Sales—U. S. †	229,220					
Change in Inventory	-86,915					
Inventory, first of month	323,066	236,151				

†—U. S. Census Bureau.

†—Automobile Manufacturers Association.

## Car Registrations and Estimated Dollar Volume by Retail Price Classes\*

	JULY, 1939		FIRST SEVEN MONTHS, 1939			
	Units	Dollar Volume	Units	Per Cent of Total	Dollar Volume	Per Cent of Total
Chevrolet, Ford and Plymouth	129,965	\$95,000,000	913,269	55.76	\$868,600,000	48.26
Others under \$1,000	81,393	74,000,000	579,373	35.37	531,300,000	38.35
\$1,001 to \$1,500	14,609	17,000,000	120,815	7.38	140,700,000	10.15
\$1,501 to \$2,000	2,045	3,000,000	16,077	.98	24,700,000	1.78
\$2,001 to \$3,000	1,194	2,700,000	7,792	.48	17,800,000	1.28
\$3,001 and over	65	300,000	543	.03	2,500,000	.18
Total	229,271	\$192,000,000	1,637,869	100.00	\$1,385,600,000	100.00
Miscellaneous	37		541			
Total	229,308	\$192,000,000	1,638,410			

\* All calculations are based on delivered price at factory of five-passenger, four-door sedan, in conjunction with actual new car registrations of each model. The total dollar volumes are then consolidated by price classes.



## New Austin-Vauxhall

(Continued from page 284)

box section cross member at the front.

Semi-elliptic springs with interleaving are continued, but with the interleaving grooved to carry oil from a nipple screwed into the spring bed at each axle end. Torsion bar stabilizers back and front are also new.

Other items of the specifications are a Borg & Beck clutch with spring drive; four speeds with synchromesh for all except low gear; direct drive ratio 4.89 to 1; Girling brakes with wedge and roller shoe expansion and spring

compensation to prevent excessive rear braking; pressed-steel spoked wheels and 5.50 by 16-in. tires.

The body is a separate unit from the chassis. New in Austin practice is a separate locker for the spare wheel below the luggage compartment and carrying a glass paneled number plate with concealed lighting.

For the first time in a 12-hp. British car provision is standardized for air-conditioning and radio. The former is a new Smith equipment offered at extra cost but with provision for easy installation, including ducts for delivery of air through fish-tail outlets at the bottom of the windshield. The system

enables fresh air to be drawn in by a fan through a scuttle ventilator and passed through a water-heated radiator, though if the air inlet is closed a flap valve on the heater comes into effect and causes only air already within the body to be warmed and circulated.

### Vauxhall Prices Reduced

General Motors' British subsidiary, Vauxhall, has announced reduced prices for all models from the Ten-Four to the Twenty-five. Reductions range from £4 in the case of the standard Ten to £15 applying to six varieties of the Twenty-five.

The lower prices of the Ten standard and de luxe salons are accompanied by alterations representing additional value. The chief difference in the new model is 3¾ in. longer wheelbase and 2 in. wider track, bringing these to 97¾ in. and 49½ in., respectively, and enabling an appreciably roomier body to be provided. The hood is longer and the front fenders larger, giving the car a more imposing appearance. It is claimed that this model is now the largest 10-hp. car on the market.

As hitherto the Ten, like the Twelve-four, is unit-constructed as to chassis and body, and no fundamental departure has been made in the constructional system used to gain the "chassisless" effect. Nor has any variation of major importance been made in engine, transmission or suspension; the latter, it may be recalled, on all models, including the Sixes (Fourteen and Twenty-five), has torsion bars and tubes for independent front springing with cam-operated coil springs to cope with variations of load and road shocks.

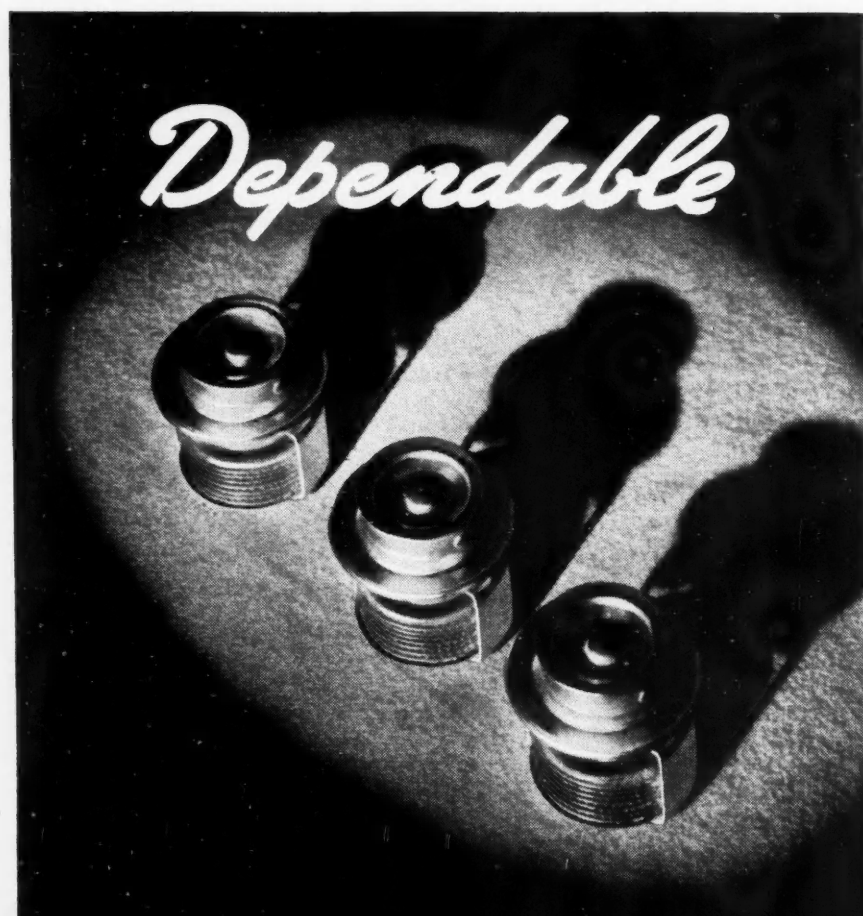
The new cars have Harris rubber bushings for rear spring shackles, a new central venturi type of Zenith downdraught carburetor with the Vauxhall "six phase" carburetion continued (a feature of which is an unusually lean mixture at part throttle openings), double-acting rear shock absorbers, full-width rear bumpers in three sections—the center one attached to the bottom-hinged locker lid to permit wider opening.

The Twenty-five (3215 cc.) is continued unchanged both in mechanical features and body work. The reduced prices range from £350 for the five-passenger "luxury" sedan. Examples of other new prices for sedans are: Ten-Four standard £159 and de luxe £169; Twelve-Four, de luxe only, £185; Fourteen-Six, de luxe only, £220.

### G. M. Studebaker

Colonel George M. Studebaker, 74, son of Clement Studebaker, one of the five Studebaker brothers whose wagon-making activities were turned to manufacturing automobiles shortly after the turn of the century, died at his home in South Bend, Ind., Aug. 27.

He had been secretary and vice-president of the Studebaker Brothers Manufacturing Co. until its reorganization.



*Dependable*

All the metal that goes into the manufacture of Harrison thermostats is rolled and annealed in Harrison's modern rolling mill.

Thus, uniformity of gauge and temper, factors so necessary to satisfactory performance and durability, are carefully controlled.

For dependable engine temperature control—specify HARRISON THERMOSTATS.

**HARRISON**

Radiator Division, General Motors Corporation, Lockport, New York

## CALENDAR

### Conventions and Meetings

SAE Tractor Meeting, Hotel Schroeder, Milwaukee, Wis. ....Sept. 28-29  
 American Society of Tool Engineers Meeting, Cleveland ....Oct. 5-6  
 SAE National Aircraft Production Meeting, Hotel Biltmore, Los Angeles, Calif. ....Oct. 5-7  
 SAE Annual Dinner, Hotel Pennsylvania, New York, N. Y. ....Oct. 16  
 American Welding Society, Annual Meeting, Chicago ....Oct. 22-27  
 American Trucking Association, Annual Meeting, Chicago ....Oct. 23-24  
 SAE Transportation & Maintenance Meeting, Coronado Hotel, St. Louis, Mo. ....Oct. 26-27  
 SAE Fuels & Lubricants Meeting, Mayo Hotel, Tulsa, Okla. ....Nov. 2-3  
 American Petroleum Institute, Annual Meeting, Chicago ....Nov. 13-17  
 National Independent Traffic League, Annual Meeting, Chicago ....Nov. 23-24  
 Motor & Equipment Wholesalers Association, Annual Convention, Chicago ....Dec. 8-9  
 SAE Annual Meeting & Engineering Display, Book-Cadillac Hotel, Detroit ....Jan. 15-19, 1940

### Shows at Home and Abroad

Great Britain, London, Automobile Show ....Oct. 12-21  
 Rochester, N. Y., Automobile Show, Oct. 14-21  
 Indianapolis, Ind., Automobile Show, Oct. 15-21  
 Los Angeles, Cal., Automobile Show, Oct. 15-22  
 National Automobile Show, New York, Oct. 15-22  
 Newark, N. J., Automobile Show, Oct. 21-28  
 Baltimore, Md., Automobile Show, Oct. 21-28  
 Buffalo, N. Y., Automobile Show, Oct. 21-28  
 Detroit, Mich., Automobile Show, Oct. 21-28  
 Milwaukee, Wis., Automobile Show, Oct. 21-28  
 Pittsburgh, Pa., Automobile Show, Oct. 21-28  
 Toronto, Ont., Automobile Show, Oct. 21-28  
 St. Louis, Mo., Automobile Show, Oct. 22-28  
 National Metals Congress and Exposition, Chicago ....Oct. 23-27  
 Italy, Milan, Automobile Salon, Oct. 25 to Nov. 11  
 Philadelphia, Pa., Automobile Show, Oct. 26-Nov. 1  
 International Automobile, Motorcycle and Motor Boat Show, Budapest, Oct. 27 to Nov. 6  
 Great Britain, London, Commercial Automobile Transportation Show, Nov. 2-11  
 San Francisco, Cal., Automobile Show, Nov. 3-9  
 Chicago, Ill., Automobile Show, Nov. 4-12  
 National Truck Show, Chicago, Nov. 8-16  
 Great Britain, Glasgow, Scotch Automobile Show ....Nov. 10-18  
 Butte, Mont., Automobile Show, Dec. 4-5  
 Automotive Service Industries Show, Navy Pier, Chicago ....Dec. 11-16

## 40 YEARS AGO

The axles and shafts employed by motor vehicle manufacturers are not always reliable. Only recently several cases of breakage have come to the editor's notice. In one of these instances the inventor had had a number of years' experience as a designer of motor carriages, but had not learned, it seemed, that the best material for a motor carriage driving axle or the driv-

ing shaft of a motor is nickel steel, the toughest steel made and comparatively inexpensive when its great superiority for this purpose is considered. No other kind of steel known to science will stand the shocks and constant vibration of road work so well as this. Other steels crystallize and weaken under the strain. Nickel steel retains its structure nearly unimpaired.—From *The Horseless Age*, September, 1899.

### A.M.A. Moves Headquarters

An announcement from the Auto-

mobile Manufacturers Association indicates that it will move its headquarters from New York to the New Center Building, Second Blvd. and Lothrop Ave., Detroit. The transfer is expected to take place by December; the present AMA office in the General Motors Building, Detroit, being continued until that time.

A New York office, including such activity as the Show management, will be maintained, as well as the present Washington office. The Motor Truck Department was transferred to Washington on Sept. 5.

**dag** takes over the load from here **450°F**

COLLOIDAL  
GRAPHITE

The use of suitable oils containing "dag" colloidal graphite provides a super lubricant which functions surely and effectively under the high temperatures met in some industrial operations.

During peak loads when temperatures exceed the ordinary protective limits of oils or greases, "dag" takes over the load supplying the safeguard needed. A recent improvement in "dag" now permits its stable suspension in low viscosity and volatile fluids which further contributes to the reduction of flake-off, carbon and wear.

A request on your letterhead will bring Technical Bulletin No. 130 and Folders 627 and 629, which supply data on the use of "dag" colloidal graphite as a high temperature lubricant.

ACHESON COLLOIDS CORPORATION  
PORT HURON, MICHIGAN

**dag**  
COLLOIDAL  
PRODUCTS



## Progress Epitomized In Mountain Ascent

(Continued from page 250)

In July, 1904, came the first "Climb to the Clouds" on the same Mount Washington road. Five American cars smashed record after record in quick succession, only to lose to Francis E. Stanley in the new Stanley Steamer in 28 min. 19% sec., while he was outdone only by a foreign car, the 60-hp. Mercedes, driven by Harry Harkness in 24 min. 37% sec. In 1905, in a second contest on Mount Washington, the

Stanley again defeated all American rivals in 27 min. 17% sec., being surpassed only by a Napier in 20 min. 58% sec.

Today the Mount Washington record stands at 12 min. 17.6 sec. Improved in width and surface, the road has been climbed by as many as 5000 cars in a year.

Born at Kingfield, Me., June 1, 1849, the Stanley brothers were educated at Hebron Academy and Bowdoin College. Engaging in photography, they speedily met with success in the manufacture of dry plates. In 1890 they removed from Lewiston, Me., to Newton, Mass., and soon began experimenting in motor

carriages, building in 1896 the first of the type used in the climb of 1899. Having sold the business to the Locomobile Company of America, they next devised the Stanley Steamer, a car of radically different type, and continued its manufacture for many years.

Francis E. Stanley died in 1918 from an auto accident, but his brother, at 90, is in good health and is interested in the making of high-class violins.

## New Caterpillar Marine Diesel

Caterpillar Tractor Co. has announced the addition of a four-cylinder, 35-hp., model D4400 engine to its line of marine diesels. The new engine is medium speed, medium weight, and suited to the work boat field.

Bore and stroke of the D4400 marine are 4¼ in. x 5½ in., and the maximum horsepower is produced at 1500 r.p.m. Standard starting equipment consists of a two-cylinder, independent, 10-hp. gasoline engine, which turns the larger engine through a disc clutch and helical gears to the flywheel. Electrical starting is also available.

## Installment Sales

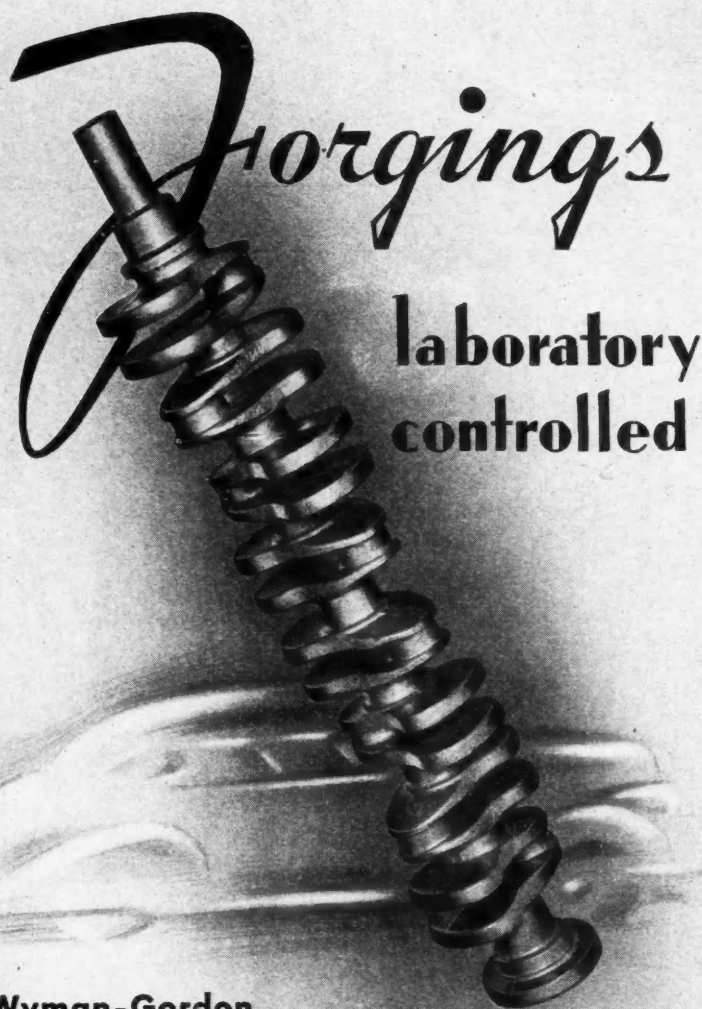
(Continued from page 281)

and 40.2 per cent in 1938, the report shows.

Automobile dealers' cash sales, which represented 37.8 per cent of their total sales in 1938, were off 24.7 per cent from 1937. Open-credit sales declined 22.3 per cent in 1938 and were 22 per cent of total sales in that year. These decreases in the cash and open-credit sales of automobile dealers in 1938 were much greater than the respective nationwide declines of 8.6 per cent and 10.3 per cent for all retail cash and open-credit sales.

All retail installment sales, of which time sales of automobiles constitute roughly 60 per cent, were estimated by the Department to have declined 28.5 per cent in 1938. The monthly trend of the installment sales of automobile dealers in 1938 showed that there was a very poor response to the seasonal factors which usually stimulate these sales in the spring and summer months, but a relative improvement was noted following the introduction of new models in the fall of the year.

At the opening of 1939, the reporting dealers' installment terms for new cars ranged from 12 months to 24 months, although comparatively few dealers offered terms at the upper limit. Eighteen months was the most frequently indicated length of new car contracts, and only 21 per cent of the reporting dealers sold exclusively on 12-month terms. Used-car terms ranged up to 18 months, but the majority of reporting dealers sold on 12-month terms. The 33 1/3 per cent down payment was most frequently reported with all contracts for new or used cars.



**Wyman-Gordon**

**forgings**

are under laboratory control from raw material to finished product. That's why they are always guaranteed forgings.

**WYMAN-GORDON**  
**GUARANTEED FORGINGS**  
WORCESTER, MASS • HARVEY, ILL. • DETROIT, MICH.